Exploring the influence of demographic factors on mothers' nutritional knowledge through the use of Food Based Dietary Guidelines

by

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Submitted in accordance with the requirements for

the degree of

MASTER OF CONSUMER SCIENCE

at the

UNIVERSITY OF SOUTH AFRICA

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APRIL 2018

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DEDICATION

This study is dedicated to:

- My late parents, Mr Yisemkhulu Conjwa and Ms Nonkululeko Matshayana for their support, encouragement and a strong spiritual background.

- My late uncle, Dr Thozamile Matshayana who passed on in August 2017. You taught me discipline, patience, life principles and independency. I thank you for always motivating me to study.

- Mr Jomo Cebiso Majija, my wonderful husband, for all his love and undying support when I really needed it the most. I thank you for always encouraging, listening, giving valuable advice and knowing exactly what to say which kept me motivated, it meant everything to me. I sincerely thank your generosity of letting me follow my dreams. I will always love you.

- Ziphozihle, my late dear son who accidentally passed on in August 2016, looked forward for my completion, but regretfully just missed my graduation.

- Lithalethu, Banele and Vuyisanani, my loving children for support and understanding. Please forgive me for depriving you of family quality time. Just your presence encouraged me to work even harder. I hope one day you will read this and be proud of me. You mean the world to me and I love you so much.

- My nephew Athini and nieces Zimbini and Nombini for support and encouragement.

- My late brother, Thulani who consoled me throughout all challenging times.

- My siblings Bro Mnce, Deeds and Zim (asa) for the support.

UNISA college of agriculture and environmental sciences

DECLARATION

I **YOLISA CHRISTINA MAJIJA** hereby declare that the dissertation/thesis, **Exploring the influence of demographic factors on mothers' nutritional knowledge through the use of Food Based Dietary Guidelines,** which I hereby submit for the degree of **MASTERS IN CONSUMER SCIENCE** at the University of South Africa, is my own work and has not previously been submitted by me for a degree at this or any other institution.

I declare that the dissertation /thesis does not contain any written work presented by other persons whether written, pictures, graphs or data or any other information without acknowledging the source.

I declare that where words from a written source have been used the words have been paraphrased and referenced and where exact words from a source have been used the words have been placed inside quotation marks and referenced.

I declare that I have not copied and pasted any information from the Internet, without specifically acknowledging the source and have inserted appropriate references to these sources in the reference section of the dissertation or thesis.

I declare that during my study I adhered to the Research Ethics Policy of the University of South Africa, received ethics approval for the duration of my study prior to the commencement of data gathering, and have not acted outside the approval conditions.

I declare that the content of my dissertation/thesis has been submitted through an electronic plagiarism detection program before the final submission for examination.

Student signature:  Date: **17 MARCH 2018**

ACKNOWLEDGEMENTS

I am strongly reminded of the extent to which I am indebted, with heartfelt thanks and appreciation to the Lord, Almighty, for the completion of this milestone in my career. I further extend my sincere gratitude to the following individuals who contributed immensely towards the success of this research:

- Dr T.S. van Eeden, my co-supervisor, for her support, encouragement and advice.
- Prof JB Dewar, for editing (language) the dissertation.
- The UNISA Research Office for awarding me Postgraduate Bursary.
- The Walter Sisulu Research Fund for awarding me a research bursary.
- Community leaders in different positions, for giving me permission to work with their communities including the Superintendent of Nelson Mandela Academic Hospital, Dr TM Madiba, the Director for Local Health Centres, Mrs N Ntshanga and the Provost of St John's Collegiate Church, Ms Mbhele.
- Two research assistants, who went out of their way assisting me in distributing the questionnaires to the respondents at different sites during the data collection. Their assistance is highly appreciated.
- Mothers who agreed to participate in the study by providing the data and giving up your valuable time to complete the questionnaire. Your efforts are greatly appreciated. This study would not have succeeded without your participation.
- Mr Zweli Baleni for technical editing the final document.

ABSTRACT

Mother's nutrition knowledge, one of the guiding factors in developing children's healthy eating patterns, has received relatively little research attention. This study determines the influence of demographic factors on mothers' nutritional knowledge in Mthatha in the Eastern Cape Province of South Africa. Quantitative, exploratory descriptive survey used group administrative questionnaire. Closed and open ended questions solicited data in 350 purposely and conveniently selected respondents. SSPS 26.0 Version analysed the data and Factor Analysis summarized for easy interpretation. Although SA FBDG are based on the current consumption of locally available foods, respondents were largely unaware of this tool. Mothers receive informal education on Dietary Guidelines from health centres, but no one knows the extent to which they understand and apply the information. There is general lack of correlation between nutrition knowledge and its application. Mothers require nutrition education and practical application of FBDG to improve their and children's nutrition security.

ISISHWANKATHELO

Luncinane kwaye alukho nzulu uphando olukhe lwenziwa ngolwazi lomzalikazi ngendlela yokondla. Olu lwazi yenye yeenqobo zokukhokela isiqhelo sokutya ngokunempilo. Esi sifundo senziwe eMthatha, kwiMpuma Koloni yoMzantsi Afrika kwaye siqwalasela ifuthe leempawu zesimo soluntu kulwazi lomzalikazi ngendlela yokondla. Uphando lwenziwe ngokuqwalasela ulwazi olufunyenwe kubantu abaninzi ngokunika amaqela abantu uludwe lwemibuzo. Imibuzo enempendulo ethe gca (evalekileyo) okanye enempendulo exhomekeke kwizimvo zomntu (evulekileyo) yabuzwa kubantu abangama-350 ababekhethwe ngobuchule. Iinkcukacha zolwazi zahlalutywa ngokusebenzisa ubuchwepheshe beSSPS 26.0 lwaze uhlalutyo olwaziwa ngokuba yiFactor Analysis lwashwankathela ukuze ulwazi olufunyenweyo lutolikeke lula. Nangona isikhokelo sendlela yokutya esaziwa ngokuba *yiSouth Africa food-based dietary guidelines* (SA FBDG) sisekelwe kukutya okufumanekayo endaweni, abathathi nxaxheba abaninzi kolu phando babengazi nto ngesi sikhokelo. Abazalikazi bafumana imfundo engekho sesikweni ngesikhokelo sendlela yokutya kumaziko empilo, kodwa akukho mntu waziyo ukuba bayiqonda kangakanani, beyilandela kangakanani loo nto bayifundiswayo. Kukho ukungahambelani okuxhaphakileyo eluntwini phakathi kolwazi ngendlela yokutya nokulusebenzisa olo lwazi. Abazalikazi badinga ukufundiswa ngendlela yokutya nokusebenzisa isikhokelo iFBDG ukuze baphucule indlela yokutya bona nabantwana babo ngokukhuselekileyo.

KAFUSHANE NGOCWANINGO

Lusathole ukunakwa okuncane kakhulu kwezocwaningo ulwazi lukamama mayelana nokudla okunomsoco, okungenye yezinto eziqondisayo ekuthuthukiseni izindlela zokudla okunempilo ezinganeni. Lolu cwaningo luzocubungula futhi luhlonze umthelela wezimo zenhlalo ezigabeni zabantu abahlukahlukene olwazini lomama mayelana nokudla okunomsoco eMthatha esifundazweni saseMpumalanga Koloni eNingizimu Afrika. Ucwaningokuhlola (isaveyi) olukhwantithethivu (olugxile emananini kanye nobuningi) oluhlolisisayo futhi oluchazayo, lwasebenzisa iphephamibuzo eligcwaliswa ngababambiqhaza abayiqembu. Imibuzo evalekile kanye nemibuzo evulekile yasetshenziswa ukuthola idatha kubabambiqhaza bocwaningo abangama-350 ababekhethwe ngabomu ukufezekisa izinhloso zocwaningo. I-SSPS 26.0 Version yahlaziya idatha kanti futhi i-Factor Analysis yafingqa idatha ukuze ihumusheke kalula. Nakuba imihlahlandlela yokudla okunomsoco yaseNingizimu Afrika (SA FBDG) isuselwe ekudliweni kokudla okutholakala kuleli lizwe njengamanje, ababambiqhaza babengenalo ulwazi lokuthi kukhona imihlahlandlela enjengalena. Omama bayafundiswa, ngendlela engahlelekile, ezizindeni zezempilo mayelana neMihlahlandlela Yokudla Okunempilo, kodwa-ke akekho owaziyo ukuthi baluqonda kangakanani ulwazi abaluthola lapho, futhi balusebenzisa kangakanani. Kuvamise ukuthi kungabi khona ukuhambisana nokuxhumana phakathi kolwazi oluphathelene nokudla okunomsoco kanye nokusetshenziswa kwalo. Omama bayakudinga ukufundiswa mayelana nokudla okunomsoco futhi kuqinisekiswe ukuthi imihlahlandlela yama-FBDG isetshenziswa ngendlela ephathekayo futhi ebonakalayo ukuze bakwazi ukwenza ngcono ukutholakala kokudla okunomsoco, kubona omama ngokwabo kanye nezingane zabo.

SUMMARY

The aim of this study is to determine the influence of demographic factors on mothers' nutritional knowledge. The study involved an exploratory survey as well as conducting a descriptive cross sectional study using a quantitative research design so as to collect and analyse data obtained from participating mothers who are responsible for choosing and preparing food for their children residing in Mthatha in the Eastern Cape Province of South Africa.

Nutrition knowledge of mothers, which is one of the factors that guides children in developing healthy eating patterns, has received relatively little research attention. For instance, mothers receive informal education on Dietary Guidelines in health centres and in the media, but no one knows the extent to which they understand, apply or implement these guidelines at home. Furthermore, Hardcastle and Blake (2016) and McLead (2011) argued that as much as maternal knowledge is likely to play a substantial role in shaping children's eating habits, there is a general lack of correlation between nutrition knowledge and its application (Ntuli 2005).

The respondents in this study were selected purposely and conveniently. The group administrative questionnaire was used for data collection to attempt to address the objectives of the research. The questionnaire comprised 49 closed-ended nutrition knowledge questions relating to healthy food, food and nutrition practices and preparation techniques. The questions also included identification of snack items, daily water intake, food choice, food hygiene and food preparation techniques. The respondents were required to tick in the box that best represented their answers to each question. Section B of the questionnaire specifically included open ended questions to measure other nutrition-related opinions of the respondents such as healthy eating, eating practices and reasons for considering certain types of food as healthy. The food-related questions incorporated the South African Food-based dietary guidelines (FBDG). The last section C required the respondents' demographic profile such as age, education level, marital status, employment status, income level, number of children at home and their age. The questionnaire was sampled to a group of 350 mothers as key informants of this study.

Data were analysed by SSPS 26.0 version. Principal Component Factor Analysis (PCFA) was implemented to extract factors deemed the best fit for the 49 closed questions. The factors that emerged from analysis were aspects which the subsets of questions address or linked with and were described as ideas or perceptions related to: knowledge of healthy food and lifestyle; knowledge of unhealthy food and lifestyle; nutrition knowledge gap; distinctive healthy choices; limits as to general health knowledge and; changes in food custom. Extracted factors have

Cronbach alpha values that approach the value of 0.6 which indicates internal consistency and reliability for exploratory research. With internal consistency and reliability confirmed, measures of the six factors were calculated for each respondent. These measures are referred to as construct scores and were calculated as the mean rating value of the rating scores for an individual on the questionnaire items that form a subset of questions.

This study revealed that mothers had knowledge of certain food that are known to be good for children's growth and development. For instance, the above factors were revealed as positive responses from this study. For instance, the mean construct score for Factor 1 (knowledge of healthy food and lifestyle) is 1.73 which is converted to 2 for the rating scale. This reflects 'agreement' or a positive perception as to what constitutes healthy food and a healthy lifestyle. The same applies to Factor 2 (knowledge of unhealthy food and lifestyle) where a value of 3.5 was allocated. This is close to 4 on the Likert scale representing "disagree" and implies that the majority of the respondents disagreed with the statements/questions. This may indicate that the respondents were in fact much more informed about the healthier food choices and were able to make the distinction as to what is better for them. The construct mean for Factor 3 (nutrition knowledge gap) is within 3 on the Likert scale, responding to Neutral. Respondents were neutral on the statements that call for a broader body of nutritional knowledge, and were not exactly sure whether these facts could actually be true. For Factor 4 (distinctive healthy choices) is 3.80 which is close to 4 on the Likert scale representing "disagree"? This implies that the majority of the respondents were able to very emphatically eliminate unhealthy food choices and have a better knowledge about healthier food choices. Factor 5, which refers to limited general health knowledge scored 2.55 which is close to 3 on the Likert scale representing "neutral". This implies that the respondents were indifferent in their responses to the general knowledge about the aspects that contribute to a healthy lifestyle. The respondents' general health knowledge may still be lacking that may result in uncertainty when responding to such statements. For Factor 6 (changes in food custom), the mean construct score was 3.66 which approximates to the value of 4, suggesting 'disagreement' or a negative perception of habits that result in customary practices being challenged as a result of better informed choices.

The 11 open-ended statements were in line with the aforementioned factors in that: the majority of respondents gave positive responses when asked about good nutritional practices regarding their children. Of the respondents, 57, 4% stated that their children like milk and fibre content food, as well as fruit and vegetables; 4, 7% eat pap and milk and 9, 3% avoid fatty foods. This sums up to 71, 5% positive responses required for healthy growth and development. Additionally, although the SA FBDG are based on the current consumption of locally available

foods, the respondents participating in this study revealed that they were largely unaware of the SA FBDG.

If the parents could receive proper education about nutrition, it will have a major impact on children's health and this would improve nutritional security. More so, mothers require practical application of the FBDG and knowledge as to how they can meet their children's nutritional needs with available resources.

KEY WORDS*: Exploratory study, Nutrition knowledge, Influence, Food-Based Dietary Guidelines, Eating habits*

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DEFINITION OF TERMS

Care: Care refers to safeguarding and promoting the well being of the child (Children's Act 38 of 2005).

Food-Based Dietary Guidelines: Food-based dietary guidelines (FBDGs) are brief, positive dietary recommendation messages that are used to inform consumers how to choose food and beverage combinations that will lead to a diet that is adequate, that meets nutrient need and that is, at the same time, prudent, for example, which lowers the risk of non-communicable diseases (NCDs) (Vorster, 2013)

Food habits: describe the manner in which humans use food, including everything from how it is chosen, acquired, and distributed to who prepares, serves, and eats it (Almerico, 2014).

Food security: refers to when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (WHO, 1996).

Eating habits: refers to why and how people eat, which foods they eat, and with whom they

Practices: refers to dietary intake data which includes information about usual daily food intake, eating pattern and usual nutrient intake (Okeyo 2009:12).

Malnutrition: a state in which the physical function of an individual is impaired to the point where he or she can no longer maintain adequate bodily performance process such as growth, pregnancy, lactation, physical work and resisting and recovering from disease (Ismail & Suffla, 2013).

Nutrition knowledge: Nutrition knowledge, broadly defined, refers to knowledge of concepts and processes related to nutrition and health including knowledge of diet and health, diet and disease, foods representing major sources of nutrients, and dietary guidelines and recommendations (Miller and Cassady, 2016).

Nutritional status: The growth or micronutrient status of an individual (UNICEF, 2012).

Nutritional transition: defined as broad patterns of food and beverage consumption and physical activity and inactivity and the subsequent shifts in body composition and corresponding nutrition-related disease (Popkin, 2015)

Socioeconomic status (SES): is defined as a measure of one's combined economic and social status and tends to be positively associated with better health (Baker, 2014).

ACRONYMS

Acronym	Meaning
AIDS	Acquired Immune Deficiency Syndrome
CBNP	Community based nutrition Programme
CHD	Coronary Heart Disease
DG	Dietary Guidelines
DoH	Department of Health
FAO	Food and Agricultural Organization of the United Nations
FBDG	Food-based dietary guidelines
FGP	Food guide pyramids
HIV/AIDS	Human Immuno-deficiency Virus/Acquired Immuno-Deficiency Syndrome
INP	Integration Nutrition Programme
NCD	Non-communicable diseases
NNSDP	National Nutrition and Social Development Programme
NFCS	National Food Consumption Survey
PEM	Protein Energy Malnutrition
PEMS	Protein Energy Malnutrition Scheme
PSNP	Primary School Nutrition Programme
RDA	Recommended Dietary Allowance
RDP	Reconstruction and Development Programme
SA	South Africa
SAFBDGs	South African Food-based Dietary Guidelines
SAVACG	South Africa Vitamin A Consultative Group
SPSS	Statistical Package for Social Sciences
UNICEF	United Nations Children's Fund
USDA	United States Department of Agriculture
WHO	World Health Organization
WSU	Walter Sisulu University
YRBS	Youth Risk Behaviour Survey

CHAPTER 1

INTRODUCTION OF THE STUDY

1.1. BACKGROUND AND MOTIVATION

Healthy eating habits for children are important to limit the incidence of malnutrition and subsequent events of stunting, growth retardation, and acute child nutrition problems. Such eating habits may prevent chronic, long-term health problems, child communicable and non-communicable diseases (NCDs) including obesity, diabetes, and cardiovascular diseases (Yabancı, Kısaç, Karakuş, 2014). Malnutrition is a serious problem affecting many people in developing countries (Malotja 2008:1) of which South Africa (SA) is no exception. According to Spires, Delobelle, Sanders, Puoane, Hoelzel, Swart (2016), currently, NCDs are the leading causes of death worldwide, resulting in 16 million premature deaths each year and this is projected to worsen. In 1999, NCDs were estimated to have contributed to just under 60% of worldwide deaths and around 43% of the global burden of disease while based on current trends predicted by the World Health Organization (WHO), these diseases are forecast to account for 73% of deaths and 60% of the disease burden by the year 2020. In addition to the morbidity and mortality associated with NCDs, infectious diseases have a massive impact on children.

The United Nations Children's Funds (UNICEF) (2007: 2) highlighted that undernutrition has been estimated to be an underlying cause for about half of all child death worldwide. In 2007, UNICEF recorded 9.2 million child deaths under the age of five, globally, and in 2016, UNICEF revealed that, of the 5.9 million under-five deaths, almost half were caused by infectious diseases and conditions such as pneumonia, diarrhoea, malaria, meningitis, tetanus, measles, sepsis and AIDS. Pneumonia and diarrhoea remain leading causes of death in the three regions with the highest under-five mortality, Eastern and Southern Africa, South Asia and West and Central Africa (UNICEF, 2016). Okechukwu and Nwalozie (2011) also alluded to the fact that diarrhoeal disease, severe anaemia from severe malaria and malnutrition were the three main causes of mortality in children.

According to UNICEF, World Health Organisation (WHO) - World Group Bank (2015), out of 667 million children under 5, globally in 2014, an estimated159 million were stunted, 41 million were overweight and 50 million were wasted. A regional overview depicts that the number of stunted children in Africa is rising and that overweight children is on the rise in all regions. It is evident that malnutrition takes a substantial toll on nation-states, affecting productivity, growth,

health and quality of life of people. Global estimates indicate that the biggest increase in NCD deaths will occur in low- and middle-income countries (LMICs) where, currently, already 80% of global NCD deaths occur.

Furthermore, the South African National Department of Health (NDOH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC), and the ICF (2017) reported that stunting remains a national concern, with 27% of South African children showing signs of chronic malnourishment. One third of child deaths are associated with malnutrition but while the prevalence of stunting raises concern, some encouraging statistics displayed an overall decline in the under-5 mortality and the infant mortality rates with 42 deaths and 35 deaths per 1,000 live births, respectively (South Africa Demographic and Health Survey 2016).

Vorster (2010) is of the opinion that, malnutrition in children is the consequence of food insecurity, which stems from poor food quality and quantity, severe repeated infections or combinations of all of these factors. These conditions are linked to the standard of living and whether basic needs can be met. The extent of hunger has also been associated with low energy intake, low micronutrient intake and poor income levels. This affects growth patterns negatively as it leads to growth failure and functional disability (Labadarios 2005:119; Napier, Oldewage-Theron & Kearney, 2009:96). Even though poverty is considered to be one of the main reasons for malnutrition, it need not be the cause as it could be argued that people who are considered to be poor but have knowledge of nutrition should be able to select proper foods and, thus, have healthy, balanced diets. It, therefore, becomes necessary to question the expected nutrition knowledge that parents have (Eat Right Ontario 2010), so as to ensure that good eating patterns are instilled in their children (Marshall 1995; Abdollahi, Amini, Kiani, Dakhah-piraghag, Esrami-amirabadi, Zoghi, Assasi, and Kalantari 2008:83).

Lack of proper education and illiteracy amongst parents and children might contribute to the growing malnutrition epidemic (Oosthuizen 2010: 4). Scott (2006) is of the opinion that improved maternal education is coupled with reductions in prevalence of wasting, stunting and overweight. However, in order to develop healthy children it is essential that nutrition education starts at home, by promoting the consumption of a balanced diet (Briley and Roberts-Gray 1999: 33; Kobayashi et al 2010).

According to Mushapi (2011) adequacy of the diet can be assessed by various guidelines, including Nutrient Based Guidelines (NBG), Food Guides (FG), Food Based Dietary Guidelines (FBDG), US dietary goals and food exchange systems. Of these guidelines, FG and FBDG appeared more relevant in the current study as they were formulated to address the existing

malnutrition in the form of under- and over-nutrition in different communities of South Africa (Okeyo, 2009:24). Furthermore, knowledge aids describing basic food groups and dietary guidelines are readily available and helpful when planning adequate dietary intake (Shakkour, 2007:8). Gibney and Vorster (2013) stated that FBDG is a tool developed to promote health for South Africans over the age of 5 and is intended to provide nutrition education and dietary guidance for individual members of the general public with health problems within a specific community. However, the overall aim of the South African FBDG is to address identified nutrition-related public health problems in South Africa (Vorster, Love and Brown 2001 in Okeyo 2009) as well as nutrition transition experienced by many South Africans (Vorster et al., 2001). Nutrition transition explains the recent rapid rise of overweight and obesity in "middle-income" developing countries undergoing rapid social, economic and technological changes. This concept indicates a shift from traditional diet towards a modern one, including excessive consumption of foods, high in animal and partially hydrogenated fats and sugar content, processed foods, packaged snacks, artificially sweetened drinks, and foods low in fibre (Zarei and Ahmadi, 2015). However, the diet of any individual whether child, adult or adolescent is the result of a range of complex and conflicting factors.

According to Warwick et al (1999: 2), this complexity increases when focus is placed on children, who are considered to be within a stage of development that may be described as "turbulent" and characterized by major physical and psychological changes. Furthermore, Lockyear (2004) stated that, early food experiences shape and determine later food preferences as repeated exposure to certain foods influences a child's preference for that food and can shape eating behaviour later in life. However, Campbell (2006: 12) is of the opinion that while a child's eating behaviours are learnt in early childhood, the home environment exerts substantial influence in the development of these behaviours. Therefore, it is suggested that a children's environment which includes the presence of the parent/care giver together with their nutritional knowledge, influences the eating habits of children.

Campbell (2002: 13); Niklas (2005: 2); POST (2006) and Kelly et al (2006: 416) agree with Warwick et al, (1999) that children's eating habits appear to be motivated by a range of influential factors. However, POST (2006) further argues that social factors have a profound influence on food choice resulting in particular eating habits, of whom parents, but more specifically mothers, appear to be the most instrumental in teaching children certain food behaviour through direct communication with these children. Furthermore, Clark Goyder, Bissell, Blank, Peters (2007:133) highlighted that parents' influence is thought to be the strongest in early childhood, when parents act as providers, enforcers and role models through which eating habits are established. Where young children are concerned, Vereecken et al

(2004: 93) argue that the most influential aspect of the immediate social environment is the family, though as children grow up and start school, their teachers, peers and other people at school together with the media may become more and more important in developing their food habits.

As mentioned, the diet of any individual is the result of a range of complex and conflicting factors. However, this study will focus on nutritional knowledge of mothers, their understanding of FBDG and the eating habits of their children. A mother's nutritional knowledge is essential for developing healthy eating habits (Roberts 2006). Although children's eating habits appear to be motivated by a range of social and parental influences, mothers are instrumental in teaching children certain food behaviour (Campbell, 2002: 13: Niklas, 2005: 2 Kelly et al., 2006: 416). Mothers act as providers, enforcers and role models to children (Clark et al., 2007: 133) hence they dictate which foods are available, They decide how foods are prepared and the size of the food portions (Wardle et al 2005:227). Clark et al. (2007) also emphasize that parents (mothers, in this case) who are nutrition literate are more likely to make healthy food choices for their children. Furthermore, Blaylock, Variyam and Lin (1999) found significant evidence that the more a mother knows about health and nutrition, the better is the overall quality of her children's diet. It can be suggested that resulting from this discussion, exploring mother's nutritional knowledge as a possible influence on the eating habits of children is necessary in order to understand the significance of their nutritional knowledge on a child's nutritional status, as mothers play a primary role in their children's nutrition and health.

1.2. RESEARCH PROBLEM

South Africa is faced with a serious challenge to address the problem of malnutrition, so as to improve the nutritional status of vulnerable and affected groups as well as to ensure optimal nutrition (Molotja 2008:6). Irrespective of policies and programmes carried out to combat malnutrition (such as the Integrated Nutrition Programme (INP): Protein Energy Malnutrition (PEM), Primary School Nutrition Programme (PSNP), National Nutrition and Social Development Programme and Nutrition Promotion Programme where FBDG are embedded) in SA, there is still a massive burden of malnutrition, and related diseases (Nutrition and South Africa's Children, no date). At national level in South Africa, stunting and overweight remain the most common nutritional disorders affecting one in five children and one in ten children, respectively (Olderwage – Theron and Egal, 2010). More so, Olderwage-Theron and Egal (2010:149) in their "Input Paper for Health Roadmap (2008:3) emphasize the fact that despite various nutrition and primary health care programmes initiated in SA over the last decade, the child malnutrition rate and child health in general has deteriorated. This may be prevented or at least reduced by ensuring that the nutritional status of children is improved (Scott, 2006: 16).

Furthermore, Jerome and Ricci (1997:1198S) highlighted that adequate nutrition as a prerequisite for good health depends on many factors that intervene in the relation between food and health. People who have adequate knowledge of nutrition make healthy food choices (Aihara and Minai, 2011; Parmenter et al 2000). However, studies on the nutrition knowledge of mothers (McLeod, Campbell & Hesketh, 2011; Variyam, Blaylock, Lin, Ralston & Smallwood, 1999; Vereecken & Maes, 2010) have been completed although not much has been done in South Africa to determine if this knowledge is in fact applied or even if the circumstances of the mother allow for the information to be used. It is widely understood that mothers receive informal education on Dietary Guidelines in health centres and through the media, but it is not clear if this knowledge is applied or implemented at home. To this effect, Mc Lead (2011) argued that as much as maternal knowledge is likely to play a substantial role in shaping children's eating habits, there is a widespread lack of correlation between nutrition knowledge and the application of that information (Ntuli 2005). Furthermore, Du Plessis (2012) is of the opinion that if nutrition knowledge is distributed to the population especially women, it will help both parents and children to make healthier choices and increase their nutrition information and knowledge. In addition, and more specifically in Mthatha, a city in South Africa, it is not clear what nutritional knowledge mothers may have and how this (lack of) knowledge may influence the eating habits of their children.

Parmenter and Wardle (2016) indicated that many studies have failed to explore significant associations between nutritional knowledge and dietary behaviour. More so, it was recognized that there is no direct link between nutrition knowledge and action (eating habit/ behaviour) (Smatisiri and Uauy 2007: S147; Shakkour, 2007; Ntuli, 2005: 31). Current research has mostly focused on individual's nutritional knowledge in relation to the person's eating habits. Relatively little is known about the relationship between a child's diet and the nutritional knowledge of the person responsible for meal planning and preparation who is often the mother of the household (Blayblock, Variyam and Lin, 1999; Blaylock et al, 2011).

According to Van Lippevelde, Te Velde, Verloigne, Van Stralen, De Bourdeaudhuij, Manios, Bere, Vik, Jan, Alvira, Chinapaw, Bringolf-Isler, Kovacs, Brug, Maes (2013), it is well known that parents play a major role in the development of healthy eating habits in their children. These are instilled through a variety of mechanisms including role modelling a healthy diet, the availability and accessibility of nutritious foods at home, and the development of attitudes, values, and preferences. However, Patrick and Nicklas (2005: 84) stated that children choose to eat the foods that they are served with most often, and they tend to eat foods that are readily available in the home. When foods are easily accessible and ready for consumption, children are more likely to eat. More so, children's food choices are governed by their experiences with

the food served by their parents, typically the mother (Rodriguez 2011). For example, when fruit and vegetables are available, children are more likely to eat fruit and vegetables. Thus, the foods to which children are routinely exposed shape preferences and consumption (Patrick and Nicklas 2005: 84). Therefore, the availability of nutritious food and the ability of the parent to provide such food plays a significant role in establishing healthy eating habits in children (Lockyear 2004: 1), which ultimately contributes to the eating behaviour of the child. Improving nutritional knowledge, behaviour, perceptions and attitudes of mothers through nutrition education is one of the broad strategies of the Department of Health (2002a:3-4) which may ultimately improve the nutritional status of all children in South Africa.

1.3. JUSTIFICATION OF THE STUDY

The justification of this study is embedded in the challenge of South Africa's childhood mortality. In 2008, 8.8 million children who had been born alive across the world died before their fifth birthday. Most of these children lived in developing countries and died from a disease or a combination of diseases that could have been prevented or treated. Under-nutrition contributed to over a third of these deaths (UNICEF 2008) and a lack of proper education and illiteracy amongst parents and children might contribute to the growing malnutrition epidemic (Oosthuizen 2010: 4).

Internationally, the agreed quantitative target with regard to child mortality was that, between 1990 and 2015, it should be reduced by two thirds. Prevalence of malnutrition was included amongst the indicators for monitoring progress in reducing mortality among children in South Africa. Half of these mortality figures are caused by mild to moderate levels of malnutrition. Iversen, Marais, Du Plessis & Herselman (2012) are of the opinion that malnutrition in South Africa is not only marked by under-nutrition, but also over-nutrition which affect adults, young people, children and adolescents. The lack of knowledge and low socio-economic status of women have been documented by Faulds (2005: 7) as being a major contributor to poor choice of food for their children, but there appears to be little detailed literature of other influences in South Africa. However, The United Nations (2003) highlighted that children's mortality reflects the social, economic and environmental conditions in which children, and others in society, live. Hardcastle and Blake (2016) stated that understanding parents' attitude towards healthy eating and reasons underlying food choice is important to assist them in meaningful ways. To ensure optimal nutrition for all South Africans, simultaneous action in all areas is required. In this sense, a mother's basic knowledge of nutrition and understanding of FBDG in relation to the eating habits of their children becomes critical if a change in the nutritional status of children is to be made.

The aims of the developed South African Food-Based Dietary Guidelines (SAFBDG) are to help individuals and groups choose an adequate and prudent diet, to improve dietary intake, to improve nutritional status and health, and to prevent diet-related diseases (Gibney and Voster, 2011 (S2). Thus, these guidelines can be used as a basis for planning, implementing and evaluation of public health nutrition strategies (Okeyo, 2009: 24). It is essential, therefore, to conduct this study as the abovementioned occurrences may be in part related to the knowledge of mothers, and their contribution to the eating habits of children.

1.4. RESEARCH AIM AND OBJECTIVES

The aim of the study is to explore mothers' basic nutritional knowledge as a possible influence on the eating habits of their children. To achieve this aim the following objectives were addressed:

Objective 1

To determine mothers' basic nutritional knowledge by applying the current 11 food-based dietary guidelines and basic nutrition knowledge questions

Objective 2

To determine mothers perception of Food Based Dietary Guidelines.

Objective 3.

Determine the possible influence mothers may have on children's eating habits.

1.5. CONCEPTUAL FRAMEWORK OF THIS STUDY

Considering the background of the study discussed in the previous sections, the following conceptual framework as presented in Figure1.1 is proposed to guide the study in the understanding of mother's nutritional knowledge based on the FBDG as a possible influence on the eating habits/ behaviour of their children. The conceptual framework suggests the importance of the concepts related to this study and it proposes that these concepts may have an influence on each other resulting in the nutritional domain of the mother that may be transferred to a child resulting in the development of their nutritional behaviour. When the conceptual framework was developed the research objectives and the literature background of the study were taken into consideration. Thus, this study intended to explore mothers' basic nutritional knowledge through using the food-based dietary guidelines as the basic tool for understanding what a mother should know about basic nutrition and how this knowledge possible influences the eating habits of their children.

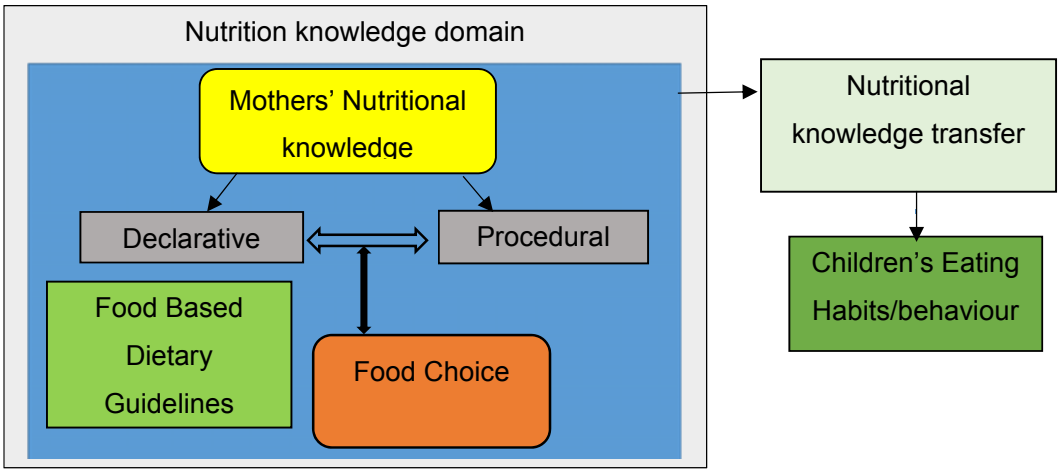

FIGURE 1.1: Suggested Conceptual Framework for mother's nutrition knowledge as to eating habits of children

Figure 1.1 proposes that mother's nutritional knowledge may either be declarative or procedural. The conceptual framework also suggests that FBDGs is a source of nutritional information that contributes to the nutritional knowledge of mothers from a declarative knowledge level. Declarative knowledge of nutrition is knowledge of things and processes (Spillmann, Siegrist and Keller, 2011), whereas Procedural knowledge is knowledge of skills and strategies (Miller and Cassady, 2015). For example, knowledge of the relationship between diet and cancer may enable consumers to focus on fibre and whole grain products. Knowledge of dietary recommendations may support a healthful choice within the context of other foods (Miller and Cassady, 2015). The conceptual framework proposes that the procedural knowledge may also have an effect on the food choice of the mother which may indirectly influence the food intake and food habits of the child. However, the framework further suggests that the nutrition knowledge domain, which encompasses the mothers' nutrition knowledge, may be transferred to children to shape their eating behaviour in the future which may lead to a better quality of life for the children and a better nutritional status of the child. Shakkuor (2007) is of the opinion that proper and healthy nutrition is a fundamental key to a better quality of life. However, the impact of the FBDGs directly contributes to mothers' nutritional knowledge and ultimately influence food choice, which ultimately leads to eating behaviour of children.

1.6. RESEARCH METHODOLOGY

This study used a quantitative research approach within the exploratory survey research design. A group administered questionnaire was used for data collection and included a number of open ended questions completed by the respondents. The questionnaire consisted

of three sections. Section A of the questionnaire was a nutrition knowledge questionnaire made up of 49 questions relating to foods, food practices and hygiene. The food-related questions incorporated the SA FBDG. The questions also included identification of snack items, water intake on a daily basis, food choice, food hygiene and food preparation techniques statements, where the respondents were required to tick in the box that best represent their answers to each statement. Section B of the questionnaire specifically included open ended questions to measure other nutrition related opinions of the respondents such as healthy eating, eating practices and reasons for considering certain types of food as healthy. The last section C required the respondents' demographic profile such as age of the respondents, education level, marital status, employment status, income level, number of years of the children at home and the age of children at home.

The target sample for this study were mothers in Mthatha urban, in the Eastern Cape Province, South Africa. The sample of mothers who participated in the study were selected based on the following inclusion criteria: females (mothers and caregivers) with children, who are responsible for choosing, purchasing and preparing food for their children. Women were included in this study based on the fact that more than 80% of all household purchases in South Africa are made by women, especially with regard to the choice of food (Davis, 2001; Rousseau, 2003). Due to the specific inclusion criteria adopted for this study a purposive sampling strategy was used with 350 respondents.

Two different recruitment sites were selected from which the sample of mothers who took part in the study were recruited. In the first instance, health care centres in the urban area of Mthatha formed the main recruitments sites for this study. These health care centres were significant in that mothers would visit these sites at various times during the day, week or month for health services of various kinds ranging from family planning, children's immunisation and any other health related matters as well as where mothers would bring children for immunisation and illness. The three health care centres that were used for recruitment of respondents for the study were Stanford Terrace Clinic, Civic Centre Clinic and Nelson Mandela Academic Hospital. The Nelson Mandela Academic Hospital is about 2,3 km from the Mthatha Central Business District (CBD) and is in the Western side of Mthatha, Stanford Terrace Clinic and Civic Center Community Clinic are approximately 2,8 km from the Mthatha CBD.

The second recruitment site used to recruit mothers for this study was the St John's Collegiate Church. The church was selected as mothers would come to the church on Sundays and were

available to be approached to participate in the study. The church is to the North Eastern side of Mthatha and approximately 1 km from the Mthatha CBD.

Permission was obtained from: the Director of Clinical Governance to conduct research within Mthatha Hospital Complex; from the Provost and the Rector of St John's Collegiate Church and; the King Sabata Dalindyebo Sub District Manager of Health department for the local clinics. These leaders formed the gatekeepers for the recruitment of mothers who took part in the study. Mc Fadyen and Rankin, (2016) defined gatekeeper as an adult who controls or limits researcher's access to participants. For example, the top manager or senior executive in an organization, or the person within a group or community who makes the final decision as to whether to allow the researcher access to undertake the research. When obtaining the permission to approach the mothers coming to the health care centres or church, the researcher set up appropriate dates to engage with the mothers. This engagement was an opportunity to explain the study to the potential respondents and to recruit volunteers to participate in the study.

1.7. DATA ANALYSIS

The data were analyzed by a statistician from Walter Sisulu University (WSU) and verified by another statistician from the University of South Africa (UNISA) using the appropriate methods and relevant software Statistical Packages for Social Sciences (SPSS) 25.0. Kruger, De Vos, Fouche and Venter (2007: 218) are of the opinion that analysis means the categorizing, ordering and summarizing of data to obtain answers to the research question. The responses to the questions were coded, computerized and analysed. Bless and Higson-Smith (2000: 137) argued that quantitative research often uses a range of descriptive and inferential statistical procedures. In this study, descriptive and factor analyses were used. Descriptive statistical analysis was used to organize and arrange data in an orderly manner so that demographic and knowledge statements in Section A and C and their results were displayed in frequency tables and graphs presented in Chapter 4. Factor analysis was used to determine patterns among the variations in values of several variables in Section B (Babbie & Mouton 2001: 472). The process of factor extraction using a pool of all the variables in the analysis led to commonalities which means the amount of variability explained by the extracted factors. The relationship between the variables lead to identifying factors which explain a percentage of variability among different variables.

1.8. PRESENTATION AND STRUCTURE OF THE DISSERTATION

Chapter 1 provides an overview of the study outlining the background and motivation, eating habits, nutritional knowledge, Food-Based Dietary Guidelines, nutrition-related issues regarding mother's role towards eating habits of children, the objectives, problem and justification for the study. This highlights the challenges on nutrition knowledge of mothers in relation to eating habits of children. However, the proposed conceptual framework is based on the problem statement, aim and objectives of the study. The chapter concludes with a brief explanation of the research methodology, data gathering instruments and data analysis. Chapter 2 focuses on the literature review related to the study. Chapter 3 presents the research methods and techniques used for selecting the participants, the study design, data collection and data analysis. Findings, discussions and interpretation of the study are presented in Chapter 4. In Chapter 5, conclusions and recommendations of the study are presented.

1.9. CONCLUSION

This chapter provided a general introduction to the research topic. The background information concerning the research problem with necessary justification regarding the research subject was presented. Relevant concepts related to the research objectives were introduced and will be clarified in the next chapter.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The previous chapter presented the background to the study, a problem statement and explained the need for this research. This chapter provides a review of the literature that addresses various aspects of this nutritional study. The chapter also reviews the factors that influence the food choice process and provides a discussion on the 2013 revised South African Food Based Dietary Guidelines (SAFBDGs). A brief overview on the possible influence mothers and, in particular, their nutrition knowledge may have on children's eating habits is also presented. In the following section, factors influencing food choice based on and explained by the Food Choice process model will be discussed.

2.2 FACTORS INFLUENCING MOTHERS' FOOD CHOICES

Food choice is defined as all outcome measures that evaluated food selection or probability of food choice, including product sales and food consumption in grams or energy intake (Bucher, Collins, Rollo, McCaffrey, De Vlieger, Van der Bend, Truby and Perez-Cueto, 2016: 2). However, Zagata (2012) are of the opinion that food choice and food practices are complex processes influenced by different interrelated and interacting internal and external environmental factors. In a recent study by Hardcastle and Blake (2016) on determining the perceptions and attitudes that underlie food choice, the researchers confirmed that economic and social factors remain salient influences of food choice. Stockli et al (2016) also alluded to the fact that the environment should not be forgotten as it has an extremely important influence on food choice. Furthermore, Nawaz, Khalid and Ahmed (2016) stated that, amongst other influences nutrition knowledge has been shown to have a positive impact on food choices and healthy nutrition life style. However, an understanding of the factors that affect food choice is crucial and should be given the attention for possibly changing the dietary behavior of people. To fully understand why people eat as they do, all the distinct components of the complex system of food choices and their interrelationships need to be understood (Krondl, 1990:14).

According to Viljoen (2009), food choice implies the process in which the individual makes decisions about what food(s) would be consumed out of the available and accessible food. Food availability and accessibility are either improved or restricted by components or systems originating from the physical, political and economic environments (Bryant et al., 2003:11; Pelto et al., 2000:2). These are determined by the geography, climate and seasonality, combined

with various technological driven influences that determine food transportation and distribution capabilities. However, from the available or potentially available food, not everything is selected for consumption, because human food choice is equally significantly guided by what food is regarded as acceptable. Furthermore, Viljoen (2009) stated that, factors from the economic, cultural and/or socio-psychological environments determine what is acceptable and these are often closely associated with the socio-cultural environment. Thus, food choice always takes place within the boundaries of what food is available, accessible and acceptable. It is only after the conditions of acceptability have been met that individual or personal factors come into play.

According to Shepherd and Raats (2006) and Sobal, Bisogni, Devine and Jastran (1998) food choice also involves a process whereby the consumer considers the selection of available food and which foods and beverages to consume. This selection process determines not only what, how, when, where and with whom to eat but also takes other aspects of their food and eating behaviour into consideration when determining what to eat. In addition, food choices are also strongly influenced by events and experiences that begin early in life and continue through the life course (National Academy of Sciences 2013).

Interestingly, Sommer (2013: 5) stated that many fields of expertise tried to find an answer to at least parts of the question: “Why do we eat what, when, and where?” Disciplines contributing to the discussion about food included biology, physiology, psychology, sociology, economics, consumer research, food science, to name a few, and each discipline attempted to respond to the question in their own right (Köster 2009). The mere fact that so many disciplines address the issue of food choice demonstrates its complexity as well as its importance (Falk, Bisogni & Sobal 1996).

However, it is clear that many of the abovementioned factors, although not saturated, may therefore play an important role in determining what the consumer chooses to eat. Viljoen (2009) proposes a model of the environmental factors (levels) that influence food choice in Figure 2.1.

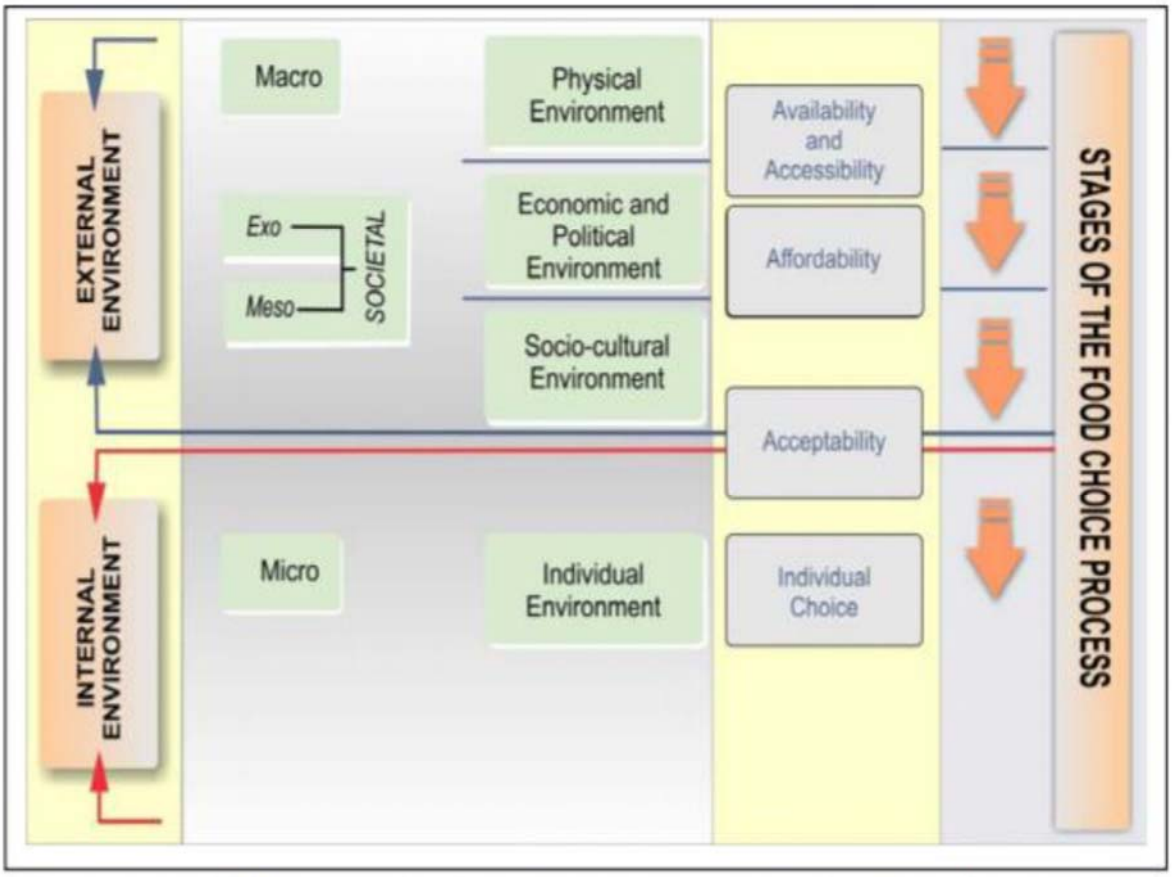

FIGURE 2.1: ENVIRONMENTAL LEVELS CONTRIBUTING TO THE FOOD CHOICE PROCESS (Viljoen, 2009:23, 279)

Viljoen's model (2009: 23), as presented in figure 2.1, shows the environmental levels and their relations and how they contribute to the food choice process. The environmental levels are distinguished into two categories, the external and internal environmental factors.

2.2.1 External environmental factors

The external environment consists of three environments; the physical environment, the political, the economic and the social-cultural environments**.**

2.2.1.1 Physical environment

The physical environment describes the natural and structural environment in which the individual lives (Viljoen, 2009: 23). Food intake is dictated by what people can get from the natural environment. For instance, foods that are planted and easily grown in a specific area frequently become a part of the local cuisine (De Weerdt, 2017). The physical environment influences what foods are accessible and available to the public. Food choice depends on the

availability and acceptability of the food product (Barasi 2003). Availability of food can be described as a wide choice of food options accessible through food systems (production, processing, packaging, distribution, marketing, consumption and disposal of food), that are acceptable and affordable to consumers (Ntuli 2005). According to Chase and Grubinger (2014), food systems refer to an interconnected web of activities, resources and people that extends across all domains involved in providing human nourishment and sustaining health. These include production, processing, packaging, distribution, marketing, consumption and disposal of food. The organization of food systems reflects and responds to social, cultural, political, economic, health and environmental conditions and can be identified at multiple scales, from a household kitchen to a city, county, state or nation. Viljoen (2009: 15) argued that physical, political and economic environments enhance or restrict food availability. People can only choose from the range of food available to them so that beyond the basic biological need for sufficient energy and nutrients from food that is physiologically available, physical environments become the most crucial determinant of dietary patterns, since food can be used only if available (Hardcastle and Blake, 2015; McIntosh 1995).

Furthermore, according to Hardcastle and Blake (2015), cost and availability of food are likely to influence food choices. Evidence suggests that when fruit and vegetables are affordable and available, children are more likely to eat them. In addition, Patrick and Nicklas (2005) children choose to eat the foods served most often, and they tend to eat foods that are readily available in the home. The food environment that parents provide shapes children's preferences and food acceptance patterns and plays a significant role in establishing healthy eating habits in children (Lockyear 2004).

2.2.1.2 Socio-cultural environment

The socio-cultural environment encompasses intertwined social and cultural concepts. The social concept refers to society and describes a group of people interacting in a common environment and who have shared institutions, characteristic relationships and a common culture (Botha et al, 2001), thus either directly or indirectly and/or consciously or subconsciously influencing what people eat (Shepherd 2006, European Food Information Council, 2004). According to Higgs (2015), the social context in which individuals find themselves and the amounts that those around us eat as well as the food choices of others have an effect on a person's food choice and subsequent food behaviour (Cruwys et al, 2015). However, Manana (2015: 13) expands on this by stating that the socio-cultural environment deals with how people share the same culture in a society. Social environments and cultural practices are powerful influences on the individual's food choice and so the socio-cultural context is the larger external environment in which the individual or group functions and

interacts, both amongst themselves and with other groups, societies and communities (Bryant, Dewalt, Courtney, and Schwartz 2003: 12).

According to Olumakaiye, Atinmo, Olubayo-Fatiregun (2010); Messer (2007: 4) and Blades (2001), culture is not only dynamic, but is also diverse, embracing symbolic, social and economic facets that influence food choice, patterns and habits. The culture of people generally brings about a common understanding expressed through their material artefacts that include their food habits and cuisine (Olumakaiye et al.2010). The cultural background is perhaps the best indicator for food preferences and choice as it determines what might appear on the plate and when. Thus, the culture provides the foundation for rules of cuisine and appropriateness of food that have been developed within a unique combination of environment ritual and belief systems (Sommer, 2013). Food as a culture reflects the group identity that differentiates one cultural group from another in many of their beliefs and practices related to their food. This includes what substances are food and not food; which rules and norms of the group governs who prepares, serves and manages food; and what kind and amount of food should be served (Menegesha and Ayele 2015). Culture is also extended to include the potential that people have to enable them to share ways of thinking, feeling and creating ways of behaviour that emanate from social interaction with others (Manana, 2015). Thus, the social group members are able to share norms, beliefs, attitudes and values about food in an identifiable social manner (Kittler, Sucher & Nahirian-Nelms, 2011: 6; Feraro, 2006:19; Bryant et al., 2003: 190-209).

2.2.1.3 Economic and political environment

The economic and political aspects of the environment refer to the ways that humans are organized and stratified within groups and communities (Bryant et al, 2003:13). Fieldhouse (1995:26), observed that the economic system includes aspects such as income, the price of food, marketing strategies and consumer demand and a similar view was expressed by Manana (2015:12) who argued that economic studies on food choice depicts that family income. Thus, food costs directly influence food selection and often dominate considerations such as healthfulness, social desirability or even the taste of food. Additionally, Sommer (2013) alluded that economic factors including food prices, income, knowledge and time are also important determinants of food choices with direct consequences for nutrient availability. Food prices, as can be expected, a□ect groups of lower socio-economic status more than others, particularly the unemployed and pensioners. Lower socio-economic status and poverty are strong predictors of unhealthy eating habits (Shelton 2005). In fact, nutritionally adequate diets, as suggested by the guidelines, can be promoted to middle and upper-income women, but

may be di□cult to be adopted by women on a low food budget (Darmon, Ferguson & Briend 2006).

Despite the availability of food, its consumption is ultimately affected by the affordability of food items. Food availability in terms of food systems (food production and processing to distribution, consumption and disposal) (Portland Plan, 2009) does not guarantee consumption, as lack of financial resources can lead people to focus on price and quantity instead of preference and quality (National Academy of Sciences, 2013). These authors argued that since cost is a major influence of food purchase, it is quite likely that healthier foods may be overlooked in favour of more unhealthy, energy-dense choices but that peoples' choice is influenced by whether or not the food is available, at a price they can afford.

In addition to external environmental factors, food choice is likely to be influenced by internal factors to be discussed in 2.2.2.

2.2.2 Internal environmental factors

Internal environmental factors that influence food choice refer to individual or personal factors. These factors represent both the biological and physiological characteristics of an individual including the individual's characteristics of knowledge, attitudes, values and beliefs (Viljoen 2002, Rozin, 2006, Sobal et al 2006). They further encompass psychological, biological and physiological characteristics of an individual (Rozin, 2006; Bryant et al 2003).

The individual environmental factor is embedded in the socio-cultural environment and refers to the distinctive characteristics of the individuals that affect their own food choices and preferences (Viljoen, 2009: 26). The cultural background and previous experiences of individuals are anticipated to reveal their personal knowledge base, beliefs, values and attitudes and guide their behaviour which would also relate to food choice and food practices (SANHANES, 2013). Messer, (2007}, Rozin (2006: 26-28) and Bryant et al. (2003), extended the list of these factors by adding not only biological and physiological ones, but also the psychological characteristics of an individual. All these factors will be discussed below.

2.2.2.1 Biological and physiological

Biological characteristics refer to the energy and nutrient requirements of an individual, which includes effective digestion, absorption and metabolism of ingested food (Manana, 2015). Sommer (2013: 6) suggested that obtaining food is central for survival and, therefore, biological determinants are expected to play a significant role in the food selection process. From a

biological perspective, there are several factors that all humans have in common, such as the regulation of energy intake and preference for certain tastes.

Most people trust that taste is the core driver for their food choices (Glanz, Basil, Maibach, Goldberg & Snyder 1998, Streptoe & Pollard 1995). Indeed, there seems to be a biological disposition to certain tastes. Humans do have an innate fondness for liking sweet and salty tastes and a dislike for sour and bitter tastes (Mennella, Pepino & Reed 2005, Wardle & Cooke 2008), but individuals di□er hereditarily in their degree of perceiving these tastes (Drewnowski, Henderson, Levine & Hann 1999, Drewnowski, Henderson & Barratt-Fornell 2001). It has also been established that humans have a preference for high energy dense foods (Zandstra & El-Deredy 2011), which is assumed to be acquired and not innate. However, Birch (1999) highlighted that, most of our food preferences result from an interaction of genetic and experiential factors, where learning plays a critical role. For instance, Mela (2006) stated that liking or palatability response when conducting hedonic sensory evaluation, is therefore predominately an individual characteristic that can be learnt.
Shepherd and Raats (2006) argued that, these personal factors develop and are learned over time for each person to provide the basis for the unique and individualized construction of food choices. Within the person-related factors, the perception and sensory experience such as taste, smell, texture and appearance of the food a person has a direct influence over his or her attitude (Sobal & Bisogni 2009). This interaction directly influences the food choice a person makes. However, in spite of these disparate influences, healthy eating is important in preventing under nutrition, growth retardation, and acute child nutritional problems (Al-Shookri 2011).

Psychological

According to Sobal and Bisogni (2009), psychological characteristics are normative gauges about what, how and when food should be eaten. These factors allow individual to be unique in their food decisions. Emotions, motives and attitudes are the main traditional psychological factors influencing food choice processes (Sommer 2013: 7) The relation between healthy food choice and emotional status is often reciprocal. Foods can either be selected for the purpose of enhancing the current emotional state, e.g. thrilling of mood, or soothing of stressed ‘nerves’; or food preferences can equally be a result of the current emotional state, e.g. increased intake of sweet, high-fat foods. Moreover, negative emotions can destroy appetite and food intake in some people, e.g. decreased appetite when stressed (Babicz-Zieli´nska 2006). Thus, emotions can affect eating habits. Sommer (2013: 7) further stated that there are motives that work together during food choice decisions such as hedonistic values of foods, sustaining health or

well-being, keeping weight down, saving money, convenience of eating and food preparation, familiarity, ethical concern, a□liation to a social group and representing social status.

Attitudes and Values

Botonaki and Mattas, (2010) described attitudes as an enduring organisation of beliefs around an object. For example, people may like or dislike a particular food based on the attitude they have about that food (Lally, Bartle & Wardle, 2011; Houser, Jonas & Riemann, 2011; Mattsson & Hemersson, 2007; Parraga, 1990). The individual's attitudes toward a particular food will either drive a negative or positive force towards its acceptance because of both affective and cognitive domains (Houser et al, 2011; Rockeach, 1973). On the other hand, values are defined as "enduring beliefs centrally located within one's total belief system" (Rockeach, 1970: 1-13). Houser et al, (2011) are of the opinion that values and attitudes are closely related and cannot be separated, as values are responsible for shaping the attitudes of an individual towards a particular food. These authors further stated that values are more stable over time and are centrally connected to people's cognitive structure. They determine what is desirable or undesirable and reflect what people desire as food. However, Houser et al (2011); Botonaki & Mattas, (2010); Fieldhouse, (1995) concluded that values and attitudes about food serve as the foundation for individual eating habits.

Beliefs

A belief is a simple proposition, conscious or unconscious, inferred from what an individual does or says (Rockeach 1970: 1-13). Food beliefs can be associated with individual's ideas about health, physiological state, social feeling or emotional state. Houser, et al (2011); Bototnaki and Mattas (2010: 629) stated that beliefs and values are enduring and are also difficult to change. Beliefs and values are part of a society's conception in regard to the way food affects the human body (Bryant et al, 2003:93).

Although food choice is influenced by a wide range of factors mentioned in previous sections, this study also focuses on mothers' nutrition knowledge and the effect it might possibly have on the eating habits of their children. Mothers, as a parent, exert an undeniably strong influence on the eating habits of their offspring since they determine which foods come into, and are prepared, in the household. Thus, the role of the parent in establishing personal food preferences in children will then be discussed below.

2.3 PARENTAL ROLE IN ESTABLISHING PERSONAL FOOD PREFERENCES IN CHILDREN

There are many influences that contributes to the eating behaviour of individuals. Exposing children to different foods is generally seen as a necessary process before children can develop their perceptions of the food that, in turn, may then influence their preferences, choice, intake and behaviour (Piscopo 2004). Patrick and Nicklas (2005), and Rodiguez, (2011) stated that children's food choices are governed by their experiences with the food served by their parents, typically the mother. Thus, parents need to know and practice the prevailing nutritional recommendations to make best food choices, as a balanced diet is essential for normal activities (Pamenter et al 2000; Khattak: et al 2007). More so, it is easier to establish positive health attitudes than change negative ones. Hence, it is universally accepted that appropriate food and nutrition education needs to start at an early age (Piscopo 2004). Mothers have to cope with issues such as quantities/ portion sizes of foods needed for maintenance of health (Marshall 1995), as lack of awareness and a lack of nutrition knowledge about the quantity of food, frequency, type of food and balanced diet contribute significantly to poor nutritional status of children. Mothers should apply their knowledge of nutrition for a better feeding pattern to their children, thus preventing the risk of moderate or severe malnutrition (Sukandar et al. 2015).

Providing exposure to a food is generally seen as a necessary process before children can develop their perceptions of the food, which in turn may then influence their preferences, choice, intake and behaviour (Piscopo 2004). Birch and Fisher (1998) highlighted that, parental directives intended to encourage or restrict children's consumption of various foods may have adverse consequences for the development of children's food preferences and regulation of energy intake. These parental directives may even be linked to subsequent development of dietary intake (Clark et al. 2007:133). However, Nawaz, Khalid and Ahmed, (2016) stated that, nutrition knowledge has been shown to have a positive impact on food choices and healthy nutrition life style.

2.4 SIGNIFICANCE OF MOTHERS' NUTRITION KNOWLEDGE

It was previously mentioned that mothers play a very significant role in establishing food preferences in children through their nutrition knowledge. Campbell, 2002; Niklas, 2005 and Kelly et al. 2006) are of the opinion that, as much as children's eating habits appear to be motivated by a range of social influences, mothers appear to be the most instrumental influence. More so, social modelling plays an important role within families where children's diets are a□ected by the types of food eaten by their parents, and their eating-related attitudes show similarities (Sommer, 2013: 9). Myeza, Selepe and Shongwe (2016) stated that mothers

should inherently have better knowledge about food as well as skill with food handling information since their primary role in the home is nurturing of family members. Thus, mother's nutrition knowledge is key in improving children's eating patterns and behaviour so that a state of adequate nutrition is reached to stimulate growth and development (Sukandara, Khomsan, Anwar, Riyadi, Mudjajanto, 2015).

According to Gichana (2013: 16), a mother's understanding of nutrition and health measures strongly influence the care they provide to their children. Conscious nutrition knowledge of mothers may be increased by providing the information on the relationship between diet and health, individuals' nutritional needs, the causes and the consequences of nutritional disorders and the benefits of food labelling and legislation (Malotja, 2008). Consequently, desirable nutritional practices may be attained by providing information on the nutritional value of foods, components of an adequate diet, making appropriate food choices and purchases from available resources, hygienic food handling and preparation of food, food storage, processing and preservation and equitable intra-household food distribution according to the nutritional needs of the family members (FAO, 2007).

A mother's nutritional knowledge is essential for developing children's certain food behaviour through direct communication and monitoring their eating behaviour (Roberts 2006). Clark et al. (2007) and Wardle et al (2005) are of the opinion that mothers act as providers, enforcers and role models to children, and, hence, they dictate which foods are available, how foods are prepared and in what quantity they are dished up. Therefore, a mothers' nutritional knowledge is an important factor in promoting healthier eating habits, and consequently, maintaining an appropriate body weight, thus, preventing undernutrition, excess weight gain and other NCDs.

However, Grafova, (2006), further stated that, having knowledge about a certain thing does not always mean direct application. Many consumers value taste, convenience, and price much more than nutrition. As such, many consumers, despite knowing that a certain food is not very healthy, may still consume the food because it provides immediate gratification (Shakkour 2007). The higher the mothers' willingness to practice what they know about nutrition and their demand for nutrition education, the better their children's dietary life becomes. Furthermore, the mothers' level of nutritional knowledge affect their children's dietary habits and activities (Lee and Joo, 2016). Sharma and Nagar (2006) revealed that educated mothers were supposed to have better knowledge of health needs and practises, but this was not always the case, due to lack of proper facilities such as basic education, income, and access to media which might affect their knowledge and practices. In order for mothers to excel on their roles, the precondition is sufficient resources (Myeza et al. 2016). Nawaz, et al. (2016)

are of the opinion that, mothers are concerned about their health and nutrition but they lack proper nutritional knowledge, which influences their food choices greatly. Nutrition knowledge presumably influences attitudes and eating behaviour (Arazi and Hosseini 2012). The following section focuses on nutrition-related problems experienced in South Africa.

2.5 NUTRITION- RELATED PROBLEMS IN SOUTH AFRICA (SA)

In developing countries, social change is occurring rapidly. Urbanization and employment of women are part of the social change that results in a significant repercussion in feeding practices (Simelane, 2008). To discuss the nutrition- related problems of South Africa, specific attention will first be given to nutritional transition which is fundamentally related to changes in lifestyle and eating habits (Zarei and Ahmadi, 2015), which have aggravated the globally accepted double burden of diseases (Triches and Giugliani, 2005) that currently exist.

2.5.1 Nutritional transition

According to Steyn and Mchiza (2014) nutrition transition is a descriptive term used to describe the shifts in dietary patterns usually experienced at the community or population level which results in less unrefined foods and carbohydrates being consumed and more animal protein, saturated fat, and sugar and a decrease in energy being used. Presently, developing countries experience rapid urbanisation due to high employment. Oldewage-Theron and Egal (2010) concur with Ntuli (2005) that this contributes to nutritional transition. In addition, Gill et al (2015) allude to the impact that 'nutrition transition' has.

As people in more traditional societies enter a food system in an urban area and adopt a more westernised-eating pattern, they enter a "nutritional transition". Their diet becomes higher in fat and low in fibre as opposed to the more traditional, prudent diet which is high in fibre and low in fat. Nutritional transition is also associated with a greater availability of processed foods such as pizza, hamburgers, cakes and pastries (Betts et al 1997:74; Lieux and Manning, 1992:561), thus increases the proportion of dietary sugar and fat increases (Nestle et al., 1998:50-59).

Inglis et al, (2003: 5) and Triches and Giugliani, (2005: 1) are of the opinion that this change of lifestyle for children and adults has resulted in altered physical activity levels and food consumption patterns. The combined effect of these changes has important implications for health status, with the complex interplay of factors contributing to adverse consequences on a population level (Faber and Wenhold 2007; Steyn (2013). The authors further argue that, reduced physical activity and a poor diet are linked with many lifestyle diseases, including obesity, type II diabetes, cardiovascular disease, osteoporosis and some cancers. Faber and

Wenhold (2007) are of the opinion that many predisposing causes of chronic diseases are associated with lifestyle. However, in this case, Labadarios (2001) argued that Food Based Dietary Guidelines should be designed for such populations and should be based on existing life style and eating patterns, based on the general SA profile.

2.5.2 Malnutrition

Malnutrition, a term associated with both underweight as well as overweight and obesity, is common in both adults and young children, especially those children aged five years and younger. According to the United Nations Children's fund reports (UNICEF et al, 2015), more than 1.9 billion people aged 18 years and older are overweight, while more than 600 million were obese in 2014. The World Bank (2015) indicated that about 39% of adults aged 18 years and older are overweight and that 13% of the world's adult population is obese.

According to the 2016 South Africa Demographic and Health Survey (SADHS 2016) conducted in South Africa in collaboration with the worldwide Demographic and Health Survey Program, stunting remains real as children under five fail to grow at the pace corresponding to their age (National Department of Health, South Africa, 2017). Van der Merwe, (2017) stated that although the national prevalence of stunting in South Africa decreased by 10.5% between 2008 and 2013, the most recent national nutrition survey (SANHANES-1) found that prevalence remains at 26% for boys and 25% for girls aged 1-3 years. The first 1000 days – from conception to about two years is described as a unique gap of opportunity for later human development. Some mothers introduce babies to poor nutritional value food and questionable safety. These poor infant feeding practices contribute greatly to the high levels of malnutrition, diarrhoea and poor growth. By the age of five years, the outcomes of any deficiency experienced during the first 1000 days of growth may be irreversible (May, 2016). Van Der Merwe (2017) further commented that, despite economic growth, political and social transitions and national nutrition programmes in South Africa over the past few decades, the stunting rate lies well above the trend for most countries that are at a similar level of economic prosperity, and this impacts economic growth and prosperity. In addition, May (2016) further revealed that, the majority of South Africa's children continue to live in households that are below the poverty line. This means that, while inequities in nutritional status may have been lessened through the existing suite of social protection policies, children remain at risk in South Africa.

2.5.2.1 Under-nutrition

As stated above, stunting remains inflexibly tenacious in South Africa, despite economic growth, political and social transitions, and national nutritional programs. According to May, (2016), stunting refers to a reduced growth size in human development and is a chronic form

of under-nutrition and is considered a long-term indicator of undernutrition that reveals the cumulative effects of poor socioeconomic, environmental, health and nutritional conditions. Oosthuizen (2010) refers to under-nutrition as a condition caused by a lack of food of good nutritional value combined with interaction from various infections such as respiratory infection, fever and diarrhoea.

The World Bank (2017) indicated that South Africa has high levels of undernutrition compared to other middle-income countries. Over one-third of child deaths are due to under-nutrition, mostly from increased severity of disease. Children who are undernourished between conception and age two are at high risk for impaired cognitive development, which adversely affects the country's productivity and growth. National data on the nutritional status of children has been scarce until the release of the third published report on the South African Health and Demographic Survey (National Department of Health et al, 2017). This report indicates that 27% of children under 5 are considered short for their age or stunted (below -2 SD), and 10% are severely stunted (below -3 SD). Stunting is higher among male children (30%) than among female children (25%).

2.5.2.2 Over-nutrition

According to WHO (2012), over-nutrition results in overweight and obesity and is defined as abnormal or excessive fat accumulation that may impair health. The most conspicuous issues associated to over-nutrition include obesity and chronic disease such as cardiovascular disease, diabetes and cancer. Nutrition transition is regarded as the cause of a double burden of obesity and inactivity.

The highest prevalence of obesity in South Africa amongst children occurs between the ages of one and three years, at 19.3 percent in rural areas and 15 percent in urban areas. A comparison between the NFCS of 1995 and that of 2005 shows that there was a decrease in the prevalence of overweight based on weight-for-height. South Africa reveals the global trend of increased overweight and obesity in adults and children. Individuals with a BMI above 25 kg/m2 are classified as being overweight, and those with a BMI above 30 kg/m2 as obese. According to Vorster (2010) the over nutrition-related diseases began before the battle against undernutrition deficiency diseases has been won. This phenomenon can, at least partially, be clarified by the effects of foetal malnutrition and the low quality of staple-food diets (sufficient energy but not enough micronutrients) in poor households.

The national food consumption survey of 1999 by Labadarios et al. (2000) showed that approximately 6% of South African children were obese. Furthermore, the study conducted

during January 2000 – June 2001 by Kruger, Margetts & Vorster (2004) (Mukuddem-Petersen & Kruger 2004) showed that stunting in girls, a consequence of chronic early malnutrition, may be involved in the development of later obesity among (black) South African women. Armstrong et al. (2006:439), who examined more than 10 000 primary-school children, concluded that at the time of the survey (2001−2004), 'South African children show trends of obesity and overweight similar to values in developed countries about 10 years ago'.

Key findings on obesity from the SADHS (2016) report shows that in contrast to undernutrition in children, two-thirds (68%) of women in South Africa are overweight or obese while only 3% are thin, and 30% are in the normal range. In contrast, just under one third of men (31%) are overweight or obese, 10% are thin, and the majority of men (59%) have a BMI in the normal range.

In the following section, attention is given to the 2013 South African Food Based dietary guidelines that aimed at addressing these factors.

2.6 FOOD-BASED DIETARY GUIDELINES

Food-based dietary guidelines (FBDG) are often developed at country level to provide support in bringing dietary intakes nearer to nutrient intake goals and, eventually, to prevent nutrition-related diseases (Schönfeldt, Hall and Bester, 2013). The South African FBDG released in 2012 advocate the consumption of a daily diet containing a variety of foods. The main goal of FBDGs is to bring population intakes closer to nutrient intake goals and as a result prevent nutrition-related diseases (WHO 2010). However, Vorster (2013) alluded that the SAFBDG are based on the current consumption of locally available foods and the FBDGs aims to address identified nutritional related public health problems and also to improve nutritional status in both disadvantaged and affluent communities of South Africa. The guidelines can be used as a foundation for planning, implementing and evaluation of public health nutrition strategies. The SAFBDG consist of eleven, short messages to the public, explained below.

2.6.1 Enjoy a variety of food

Eating a diverse diet is an internationally accepted recommendation for a healthy diet. The food-based dietary guideline (FBDG) "Enjoy a variety of foods" aims to encourage people to consume mixed meals, to increase variety by eating different foods from various food groups, and to alter food preparation methods. A diet that is low in variation is likely to be lacking in some nutrients and may result in food insecurity and consequent malnutrition. According to Steyn & Ochse (2013), a dietary diversity score (DDS) should be calculated based on nine food groups as follows: Cereals, roots and tubers, Meat, poultry and fish, Dairy, Eggs, Vitamin

A-rich fruit and vegetables, Legumes, Other fruit, Vegetables (other than legumes), Fats and oils. A DDS of < 4 is regarded as a poor nutritional diversity and, hence, poor food security, while a score of nine symbolised a very varied diet. Each food group should be counted once when calculating the DDS. In addition, graphic formats to provide a consumer friendly framework were developed, so that consumers can select a variety of foods without necessarily having specific knowledge of nutrients. Dietary diversity can be improved by choosing from a variety of foods within and across food groups that are displayed in a food guide. The consumption of a variety of low energy-dense foods (at least 20-30 biologically distinct foods) per week, drawn from all food groups, should be encouraged. However, lack of access to a diversity of food, lack of information and knowledge and high incident of food insecurity can lead to micronutrient deficiencies (Steyn & Ochse, 2013).

2.6.2 Be active!

Being physically active is as important as eating healthily. Physical activity, defined as at least 30 minutes of moderate-intensity physical activity and 60 minutes for children and adolescents, because it maintains energy balance, improves body composition and promotes general health and wellbeing. Physical activity includes normal daily activities/household chores such as cleaning, cooking, doing garden and many other home duties as well as taking stairs instead of escalator, taking a walk to town than catching taxi. Furthermore, physical activity reduces the burden of NCDs, risk of mortality and morbidity and increases quality of life (Botha, Wright, Moss, Kolbe-Alexander 2013). There is a need to promote a healthy lifestyle by increasing physical activity and healthy eating habits, as physical inactivity and poor diet are related with a wide range of NCDs, including hypertension, type 2 diabetes mellitus, coronary artery disease, strokes, cancer and osteoporosis.

However, Botha et al, (2013) are of the opinion that individuals tend to react differently to the effect of exercise on hunger and satiety, whereas some people experience increased hunger after training. This may determine whether or not one loses or maintains weight when embarking on an exercise programme. Therefore, exercise programmes and dietary intake should be individualised.

2.6.3 Drink lots of clean, safe water

Water does not provide any energy, but drinking enough clean and safe water is important. Water is an essential nutrient and a vital multifunctional constituent of the body, which regulates body temperature and builds cells in the body (Van Graan, Bopape, Phooko Bourne, Wrigh, 2013). Water also act as a shock absorber, lubricant, solvent and carrier of various compounds, nutrients and waste products. The recommended intake of daily water and beverages varies

between 2 l and 2.8 l for women, and between 2.5 l and 3.7 l for men. The provision of clean, safe water plays a major role in reaching a number of the Millennium Development Goals, such as eradicating extreme poverty and hunger, reducing childhood mortality, improving maternal health, combating HIV/AIDS, malaria and other diseases, and ensuring environmental sustainability. Furthermore, drinking lots of clean, safe water is very important in decrasing diarea in children in SA. Therefore, access to safe and sustainable sanitation and water facilities should receive high priority since it is a key factor in addressing the hurdles that prevent the country from achieving the Millennium Developmental Goals (van Graan et al, 2013).

2.6.4. Make starchy food part of most meals

The purpose of this FBDG is, to promote the intake of sufficient dietary carbohydrates from minimally processed, traditional and indigenous foods that are rich in starch (mainly wheat, maize, rice, oats and sorghum in South Africa), legumes (dried beans, lentils, peas and soya) and some root vegetables, such as potatoes and sweet potatoes (Vorster, 2013: S28). The author further indicate that a diet that is rich in whole grains and cereals, fruit, vegetables and legumes is protective against the development of NCDs such as heart disease, diabetes and cancer, through a variety of mechanisms.

According to Vorster (2013: S33), whole grains and minimally processed starchy foods should be the principal energy source in the diet. These foods also offer many other substances, such as fibre and micronutrients that are essential for adequate nutrition. The physiological effects of carbohydrates depend on the extent, site and rate of digestion or fermentation and the absorption of the end products, which are influenced by the food matrix, processing, effects of other consumed foods, and individual gut function. However, a diet that is low in variation is likely to be lacking in some nutrients and may result in food insecurity and consequent malnutrition. The consumption of a variety of low energy-dense foods (at least 20-30 biologically distinct foods) per week, drawn from all food groups, should be encouraged (Steyn & Ochse, 2013).

2.6.5 Eat plenty of Vegetables and Fruit everyday

From a nutritional point of view, vegetables and fruit can be defined as foods that are low in energy, relatively rich in micronutrients, phytochemicals and other bioactive compounds, and good sources of dietary fibre (Naude 2013: S46). The nutrition-related disease risk profile in South Africa is characterised by a double burden, with both under- and over nutrition being prevalent. In South African children the primary nutrition related conditions and risk factors include stunting, underweight, vitamin A deficiency, the risk of inadequate micronutrient intake,

overweight and obesity and the presence of early NCD risks. However, these conditions in adults, include cancer (lung, oesophageal and prostate in males, and cervical, breast and lung in females), diabetes, chronic respiratory diseases, overweight and obesity, cardiovascular diseases, hypertension and hypercholesterolemia. The author further revealed that vegetable and fruit intake has been associated with a reduced risk of many of the nutrition-related diseases and risk factors that contribute substantially to the burden of disease in South Africa. From this evidence, it is clear that interventions that aim to improve vegetable and fruit intake in the South African population have the potential to contribute to reducing the burden of nutrition-related disease, specifically by playing a role in the reduction of the risk of vitamin A deficiency in children, prevalent cancers (lung and gastrointestinal), coronary heart disease, ischaemic heart disease and cerebrovascular accidents in adults (Naude 2013: S46).

2.6.6 Eat dry beans, split peas, lentils and soya regularly

An investigation into food diversity in South Africa showed that legumes were one of the groups least consumed. The percentage of South Africans consuming legumes daily was reported to be 15.23% (Steyn et al, 2003). Legumes are rich and economical sources of good-quality protein, slow-release carbohydrates, dietary fibre (non-starch polysaccharides), various vitamins and minerals and non-nutritive components which may have numerous beneficial health effects. Pulses have a low energy, fat and sodium content. Therefore, legumes contribute to dietary sufficiency, while protecting against non - communicable diseases through many mechanisms. (Venter, Vorster, Ochse, Swart, 2013).

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2.6.7 Fish, chicken, lean meat or eggs could be eaten daily

Animal sources of food, such as fish, chicken, meat and eggs, constitute high-quantity and high-quality protein as they contain essential amino acids in the right proportions. In South Africa, eight micronutrients, namely vitamin A, vitamin B1, vitamin B2, vitamin B6, vitamin B12, niacin, iron and zinc have been identified as lacking in the population's diet. Relatively required amounts of these foods, added to a mixed diet, make a significant contribution to nutrient adequacy (Schonfeldt, Pretorius, Hall, 2013). Generally, animal sources of food (ASF) are linked with nutrients that are less desirable in the diet. These include saturated fat and cholesterol and an increase in their consumption is associated with a higher prevalence of obesity, hypertension and diabetes and mortality linked with cardiovascular diseases (CVD) (Popkin and Shufa Du, 2003). However, by choosing lean, prudent portions of these foods, the intake of such macronutrients can be controlled (Schonfeldt, et al., 2013).

2.6.8 Have milk, mass or yoghurt every day

A national working group recently reached consensus that a guideline message for milk consumption should form part of the set of revised food-based dietary guidelines (FBDGs) for South Africa. The message was formulated as: “Have milk, mass or yoghurt every day” (Vorster, Wenhold, Wright, Wentzel-Viljoen, Venter, Vermaak, 2013). In revised 2013 FBGDs for SA, a separate FBDG for milk, either fresh or powdered, and the traditional fermented milk product *mass* (also known as *amasi*), as well as unsweetened yoghurt are recommended. These are necessary due to consistent reports of low calcium and potassium intakes by the South African population and the high prevalence of hypertension and other non-communicable diseases (NCDs), as well as to prevent an increase in the intake of saturated fatty acids (SFAs), sodium and sugar, which are found in many highly processed dairy products (Vorster et al., 2013).

2.6.9 Use fat sparingly; choose vegetable oils rather than hard fats

According to Smuts and Wolmarans (2013), the total fat intake of South Africans is within the goal of ≤ 30% of total energy, but the quality or type of fat in the diet requires attention. Based on scientific research, the emphasis now is on the type of fatty acids, rather than the total amount of fat consumed. In recent years, the established relationship between saturated fat intake, hypercholesterolemia and heart disease led to a recommendation that polyunsaturated fat (PUF) margarine should replace saturated fat (SF) in the diet. New knowledge about the detrimental effects of the trans-fat content of margarines, as well as the beneficial effects of omega-3 fatty acids, have influenced fat recommendations over the years. Presently, margarine is manufactured to be trans-fat free and emphasis is placed on the quality of fat to ensure sufficient intakes of omega-3 fatty acids. The omega-3 and omega-6 fatty acids are vital nutrients involved in brain development, while others affect the development of nutrition-related non-communicable diseases (NCDs) later in life. Furthermore, the importance of energy balance (i.e. energy intake and energy expenditure), was often overlooked as a result of the emphasis on lowering total fat intake. More so, the influence of different individual fatty acids on health and disease is also better understood than it was before (Smuts and Wolmarans, 2013).

2.6.10 Use salt and food high in salt sparingly

Hypertension is estimated to have caused 9% of all deaths in South Africa in 2000. In 2008, 42% of men and 34% of women aged 35-44 years, and 60% of men and 50% of women aged 45-54 years, were hypertensive. More than 70% of both men and women older than 65 years of age were hypertensive in 2008 (Wentzel-Viljoen, Steyn, Ketterer, Charlton, 2013). Increased body weight can occur due to fluid retention because of excess sodium requiring

water from the body to neutralize it. This can be a real issue for people who want to achieve weight loss (Tarbath 2012). Blood pressure rises with increased sodium intake in the general population, and is reduced with decreased sodium intake. A high level intake of salt contributes to body metabolic factors which significantly increases the risk of strokes and total CVD. It is possible to accomplish a significant reduction in blood pressure with reduced salt intake in adults, both with and without hypertension (Wentzel-Viljoen et al, 2013).

2.6.11 Use sugar and food and drinks high in sugar sparingly

The intake of added sugar appears to be increasing steadily across the South African population. Temple and Steyn (2013) stated that **s**ugar provides only empty calories and, thus, a high intake of added sugar is associated with lessened micronutrient density of the diet resultant in dietary inadequacies. The authors further highlighted that sugar makes a major contribution to the development of dental caries and increases the risk of the development of obesity, type 2 diabetes, and probably cardiovascular disease. The intake of sugar displaces foods that are rich in micronutrients, mainly zinc, magnesium, iron and vitamin A. Therefore, both adults and children should limit the consumption of sugar-sweetened beverages (SSBs) (Temple et al., 2013).

In summary, the revised 2013 FBGDs for SA, includes a separate FBDG for milk, either fresh or powdered, and the traditional fermented milk product mass (also known as amasi), as well as unsweetened yoghurt are recommended. This is due to consistent reports of a low calcium and potassium intake by the South African population and the high prevalence of hypertension and other non-communicable diseases (NCDs). In addition, this should prevent an increase in the intake of saturated fatty acids (SFAs), sodium and sugar, which are found in many highly processed dairy products (Vorster, Wenhold, Wright, Wentzel-Viljoen, Venter, Vermaak, 2013).

Smuts and Wolmarans (2013) stated that, the original SA FBDGs for fat intake was: “Eat fats sparingly”. Based on new scientific research, the emphasis now is on the type of fatty acids, rather than the total amount of fat consumed. In recent years, the established relationship between saturated fat intake, hypercholesterolemia and heart disease led to a recommendation that polyunsaturated fat (PUF) margarine should replace saturated fat (SF) in the diet. New knowledge about the detrimental effects of the trans-fat content of margarines, as well as the beneficial effects of omega-3 fatty acids, have influenced fat recommendations over the years. Presently, margarine is manufactured to be trans-fat free, and more importance is placed on the quality of fat to ensure sufficient intakes of omega-3 fatty acids. Furthermore, the importance of energy balance (i.e. energy intake and energy expenditure), was often overlooked as a result of the emphasis on lowering total fat intake. More so, the influence of

different individual fatty acids on health and disease is also better understood than it was before. The new consensus FBDG accepted for South Africa is: “Use fats sparingly: choose vegetable oils rather than hard fats (Smuts and Wolmarans, 2013).

Additionally, the alcohol guideline was deleted, as it creates much confusion, especially the words “drink sensibly” (Vorster et al., 2013). As much as alcohol-consumption guideline has positive and beneficial aspects, it also have detrimental effects which lead to many social and health problems, including alcohol related crime, violence and traffic accidents, risky sexual behaviour and increased risk of human immunodeficiency virus (HIV), foetal alcohol syndrome, liver disease and malnutrition. The negative health outcomes of alcohol consumption far outweigh the positive ones in South Africa (Jacobs and Steyn, 2013).

According to Vorster (2013), revision of the South African FBDGs has occurred following reports on the beneficial effects of whole grains, dietary fibre, and pre- and probiotics, the potentially protective effects of antioxidant chemicals found in plant foods, the anticancer properties of some vegetables, the bioactive compounds in milk and the contribution of added sugar to childhood obesity.

The manner in which the FBDGs are used to inform consumers about healthy eating behaviour differ and depend on the needs of the target group. Perhaps the biggest challenge with regard to implementation of the FBDGs is to change the consumer behaviour of people with the same nutrient requirements, but with very different social, economic and biological circumstances, as well as very different food preferences and eating behaviours (Vorster, 2013).

2.7 PAEDIATRIC FBDGS FOR SOUTH AFRICA

A similar process (that of developing SA FBDG for seven years and older) was initiated by the Nutrition Society of South Africa (NSSA) that appointed a workgroup to develop FBDGs for infants and children younger than seven years of age. In 2011, expert working groups, including a paediatric working group, were formed to review the new literature and make suggestions regarding revision of the specific guidelines. The expert and paediatric working groups reported their findings and made suggestions to the national working group during this meeting. The meeting consented to: the formulation of a set of FBDGs for the general population of individuals older than five years of age; a discrete set of paediatric guidelines for infants and children younger than five years of age; the inclusion of a milk guideline in the general FBDGs; attention to the quality of fats in the fat guideline and; slight changes to the wording of some of the other guideline messages.

2.8 FOOD GUIDE

Steyne and Ochse (2013) stated that, SA FBDGs needs to be understood in the context of the other FBDGs, and to be applied with the assistance of appropriate food guides that have been developed for South Africa. In 2011, the Department of Health, Directorate of Nutrition, embarked on a process, funded and supported by the FAO, to develop a food guide for South Africa. The food guide, illustrating the food groups that should be eaten regularly, developed in parallel to the revision of the FBDGs. Graphic formats to provide a consumer friendly framework were developed, so that consumers can select a variety of foods without necessarily having specific knowledge of nutrients. Dietary diversity can be improved by choosing from a variety of foods within and across food groups that are displayed in a food guide below:

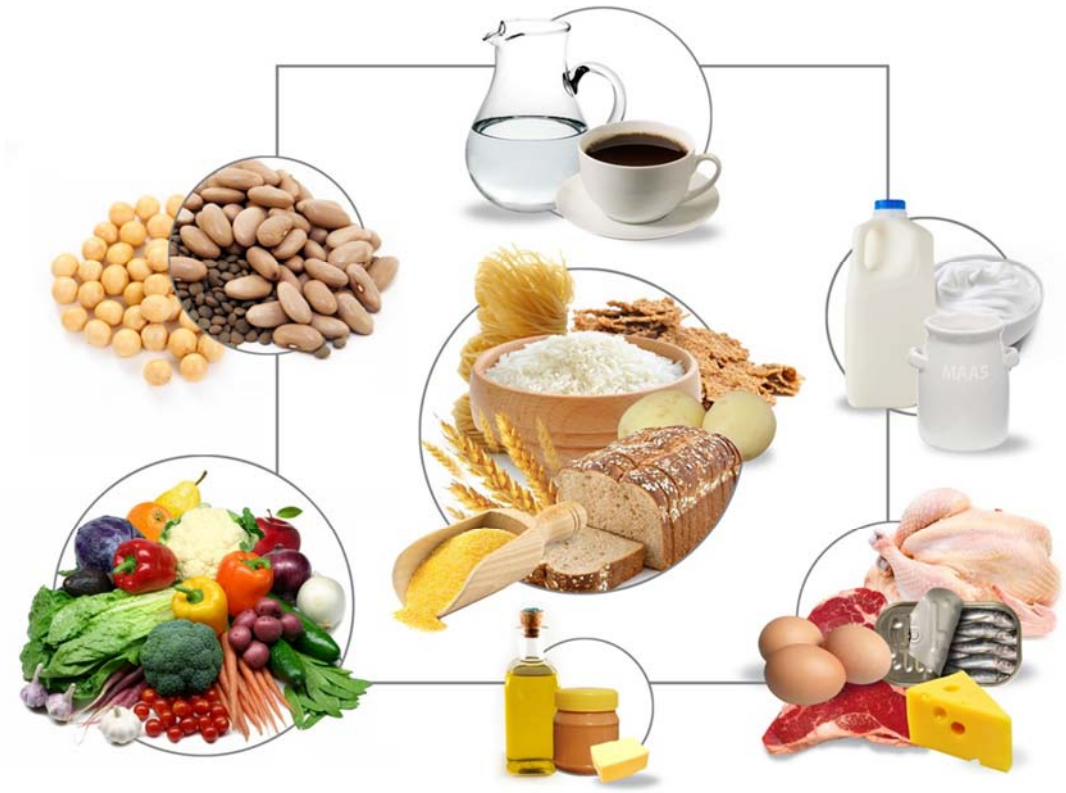

Figure 2.2: The South African food guide (Nestle; Department of Health, Directorate Nutrition)

It emphasises variety both among and within its groups, moderation in portions, and proportionality in eating more foods from the larger groups near its base and relatively fewer foods from other groups (Vorster, 2013). Transferring nutritional knowledge against a background of internal and external environmental factors is as complicated as it is

fundamental. This complication expands when linking feeding guidelines to different communities in South Africa, including those that may be living in rural and peri-urban environments such as noted in Mthatha, a city in the Eastern Cape Province of South Africa.

2.9 CONCLUSION

The important issues to consider when dealing with children's eating habits are mothers' influence, her nutritional knowledge as well as her food choices. The food choice process incorporates not only decisions based on conscious reflection, but also those that are automatic, habitual and subconscious.

The next chapter will address the research methodology and research design for this study.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

In the previous chapter, literature relating to the study was presented. This addressed various aspects of nutrition such as nutritional knowledge, the importance of mothers' nutritional knowledge in developing children's eating habits, possible factors that may influence mothers in the development of children's eating habits as well as other factors and a brief discussion on the nutritional related problems in South Africa. Chapter 3 will focus on the research methods and processes that were considered in designing the study. The research methods in this context refer to the specific procedures required for each stage of the research process such as methods and techniques of sampling, data-collection methods and data-analysis methods which were used to successfully conduct this study. This research design and related methods depended on the purpose and objectives of the study. Thus, the study purpose and the objectives which indicated the study variables to answer the research question will firstly be outlined. This is followed by the research paradigm, which is the first element to be considered in the design of a study. This chapter will also include reasons for piloting the instrument, specific discussions on the location of the study, the sampling strategy and inclusion criteria of respondents. The data gathering instrument and the design of the instrument will be presented, as well as the data analysis techniques applied to the data.

Since the choice as well as the application of the methodological approaches depends on study purpose and objectives (Yan, 2015), it is, then, suitable to include them (study purpose and objectives) in this chapter.

3.2 RESEARCH AIM AND OBJECTIVES

The aim of the study is to explore mothers' basic nutritional knowledge as a possible influence on the eating habits of their children. To achieve this aim the following objectives are formulated:

Objective 1

To determine mothers' basic nutritional knowledge by applying the 11 food based dietary guidelines and basic nutrition knowledge questions.

Objective 2

To determine mothers perception of Food Based Dietary Guidelines.

Objective 3

Determine the possible influence mothers may have on children's eating habits

Having formulated the purpose and objectives of the study, the research paradigm within which this study is organized will be discussed next.

3.3 RESEARCH PARADIGM

There are certain standards and rules that guide a researcher's actions and beliefs (Atieno, 2009). Such standards or principles can be referred to as a paradigm. However, Salma Patel, (2015) refers to the research paradigm as the set of communal beliefs and agreements shared between scientists about how problems should be understood and addressed. Furthermore, Creswell (2009) refers to the research paradigm as a worldview which is learnt by the researchers' own assumptions based on individuals own knowledge, experience and preferences. These components in combination influence the paradigm that the researcher applied in framing the strategy this study.

The quantitative paradigm was adopted for this study. According to Assalahi (2015), quantitative design includes experimental studies, quasi-experimental studies, pretest-postest designs and others, where control of variables, randomisation, valid and reliable measures are required and where generalizability from the sample to the population is the aim. Parvaiz, Mufti, Whahab (2016) indicated that the aim is to use deductive reasoning where the objective is to confirm a theory that employs primary data analysis. In the current study, the researcher tested whether the variable could represent alternative explanations, and then through statistical analysis eliminated these alternative explanations by measuring them against the control variables. This process is called non-experimental research (Polit & Beck 2013:51).

On the basis of the theory, a survey questionnaire was developed for measuring mothers' nutritional knowledge. The questionnaire included closed (Likert scale) and open-ended questions. After the planning phase, data was collected.

This study collected and analysed primary data; therefore it represents empirical research. According to Saunders et al. (2007), primary data is compiled for a specific research project being undertaken. In this study empirical data was collected to address the research objectives. Therefore, in this study basic research was undertaken to increase the scientific knowledge on mothers' nutritional knowledge in relation to the eating habits of their children within the South African context.

The next section presents the research design that guided this study.

3.4 RESEARCH DESIGN

Research design is a master plan that gives the methods and procedures for data collection and procedures that enable the researcher to carry out and implement the research project (Creswell 2013; Neuman 2011; Kumar 2011). By adopting a particular research design, the researcher is able to explain the nature of the design that will enable the researcher to obtain information in order to answer the initial research question(s) as unambiguously as possible (Bekele 2013). As relatively little is known about the relationship between a child's diet and the nutritional knowledge of the person responsible for meal planning and preparation who is, often the mother of the household (Variyam et al 1999:373), the current study focused on researching respondents' food and nutrition knowledge in relation to eating habits. In order to gain an insight and understanding of this problem, the purpose of this study was to explore these phenomena and so this study followed a survey, cross sectional design supported with exploratory and descriptive design/analysis for greater insight and better quality data (De Frenzo, 2014).

Each of these designs will be discussed in the paragraphs that follow.

3.4.1 Exploratory design

An exploratory study is adopted when the researcher has observed something and seeks to understand more about it (Kowalczyk et al., 2016) . According to Dudovskiy (2016) exploratory study intends to explore the research questions and does not intend to offer final and conclusive solutions to existing problems. It is conducted in order to determine the nature of the problem, and does not intend to provide conclusive evidence, but helps researcher to have a better understanding of the problem. In this study case, nutrition knowledge of mothers was not clearly defined and it remained a persistent phenomenon from which more data and knowledge could be generated. In terms of this study, the aim was, therefore, to explore the nutrition knowledge of mothers residing in a particular area of South Africa which has not previously been studied. This could contribute to a better understanding of the knowledge that mothers, in particular, have of nutrition and how this might influence the eating habits of their children. In this instance, it can be argued that despite the development of FBDGs in SA, the prevalence of diseases in the country still indicates a discrepancy between the dietary recommendations and feeding behavior (Oldewage-Theron and Egal 2010). This necessitated an exploratory study of the nutrition knowledge of mothers. Furthermore, Blaylock et al. (1999), Ntuli (2005) as well as Smatisiri and Uauy (2007:S147) agreed that, when it comes to children's eating habits, little is known about its relationship with nutrition knowledge of the person

responsible for family meals. These may be regarded as persistent situations that support the application of the exploratory study design as a suitable research design to adopt for this study.

3.4.2 Survey design

Survey design entails empiricist verification of theoretical positions by studying a phenomenon comprehensively and in detail. Assalahi (2015) stated that, survey quantitative methodologies represent terms such as correlational, cross-sectional and explanatory research. Leedy and Omrod (2013:189) are of the opinion that survey research acquires information from an individual which could be anything related to their characteristics, opinions, attitudes or their previous experiences by asking questions and tabulating their answers. Survey-designed study requires a tool or measuring instrument to evaluate the phenomenon under investigation (Muller, (no date), Babbie &Mouton 2011). In this case, the existing questionnaire, which was adopted and edited for the context of the study, was presented to respondents who could indicate their nutrition knowledge as residents of a particular area of South Africa. The measuring instrument included questions relating to biographic data; SA FBDG; food choice; nutrition knowledge and eating habits components which respondents had to complete in order to solicit the appropriate answers for the phenomenon under investigation. The strength of this design is that it:

- Is suitable to describe the characteristics of a huge population
- Is able to allow the researcher to ask various questions on a given topic that measure the main variables (dependent and independent) to determine whether the correlations exist or not
- Is considerably supple as to data analysis
- Permits the researcher to develop operational definitions based on actual observations (Babbie & Mouton, 2011: 263).

The above information supports the application of the survey design as a suitable research design to adopt for this study.

3.4.3 Cross-sectional design

A cross-sectional design involves the collection of data on more than one case at a single point in time in order to collect a body of quantitative or quantifiable data in joining two or more variables. These are then examined to identify patterns of association (UK Essays, 2013). The Cross-cultural Survey Guidelines (2016) reported that, since sampling units are only asked to participate once in a cross-sectional survey, this can make it easier to convince the sampling units to participate. An additional advantage of cross-sectional aspects of this study design was revealed by Olchers (2011: 118) that, it is generally quick, easy, and cheap to perform and

is often based on a questionnaire survey. As such there could be no loss to follow-up because participants are questioned only once. The Cross-cultural Survey Guidelines (2016) further stated that, the respondent burden over time is less than it would be in a panel survey, which includes costs and eventually makes respondents less interested in taking part in the research. Furthermore, the researcher recommends cross-sectional design as Babbie & Mouton (2011: 92); Sedgwick, (2014) highlighted in that this is usually deployed for both exploratory and descriptive studies, as is the case with this study.

In this study, a cross-sectional survey was chosen within the non-experimental design, as measurement occurred at a single time so that individuals were selected to provide a picture of the overall mothers' nutritional knowledge experienced at a specific time. Non experimental research is one in which the researcher has little or no control (Aina, 2011). However, disadvantages of this study design are that changes over time are ignored as the research is only conducted at one point in time, (Olchers, 2011: 118). In addition, cross-sectional study may be prone to non-response bias if participants who consent to take part in the study differ from those who do not, resulting in a sample that is not representative of the population (Sedgwick, 2014). It is based on prevalent (existing) rather than incident (new) cases and is of limited value to investigate etiological relationship (Cross-sectional surveys, No date).

3.4.4 Descriptive design

Descriptive research refers to the type of research question, design and data analysis that will be applied to a given topic (n.a). This design is primarily concerned with finding out "what is," which merely seeks for an understanding or a detailed description instead of finding any causes or answer the question 'why. It is devoted to the gathering of information about prevailing conditions or situations for the purpose of description and interpretation.'(Salaria 2012). It can utilise both quantitative and qualitative elements, often within the same study. This study adopted a descriptive design as Salaria (2012) revealed that this design involves gathering data that describe events, and then consolidates, organises, portrays and describes the data collection. The author further alluded to the fact that descriptive design does not simply gather and tabulate facts but it includes appropriate analyses, interpretation, comparisons, identification of styles and relationships to a given topic. It, therefore, enabled the researcher to organize the data in such a way that it gives a clear picture of the current situation related to mother's nutrition knowledge and their children's eating habits. Subsequently, Archibold and Munce (2016) are of the opinion that, studies should employ pilot studies before the main survey is conducted. Pilot testing, therefore, will be discussed next.

3.5 PILOT TESTING OF QUESTIONNAIRE

A pilot refers to a small-scale of a complete survey or a pretest for a particular research instrument such as a questionnaire or interview guide, targeting a small number of persons with characteristics similar to those of the target group of respondents of the larger population (Janghorban, Latifnejad, Taghipour, 2013). Fink (2017) further stated that piloting provides the researcher with the required information, for example, it quickly reveals whether people understood the directions the researcher have provided and if they can answer the survey questions.

Before commencing the study, the preparatory measurers are required which include knowledge of the site, accessibility and approval for the study. Some months prior to the commencement of the study, the researcher made contact with the gatekeepers of the targeted institutions for ease of access of the researchers and the participants in the study. However, Archibald and Munce (2016) recommended that researchers should engage themselves with those familiar with the study setting. Appointments were not made with the respondents but the researcher approached the Superintendent of the hospital to inform him/her as to the dates on which pediatric immunization took place, as mothers would bring along their children to the clinics. The researcher arrived at the Ngangelizwe Mini Hospital at 7:00 on each day of immunisation to join the mothers who attended morning prayers. The Sister in charge introduced the researcher to mothers while they are still gathered in the Hospital reception hall, and then the researcher addressed the mothers and explained the research purpose and also recruited volunteers for piloting. A separate room in the hospital was allocated to the researcher and respondents for piloting process. That was convenient for mothers as they were already there, and that gave the researcher the opportunity to approach more mothers to take part in the piloting process.

Furthermore, as per Janghorban et al. (2013) viewpoint, the pilot test sample should be selected to contribute to meaningful insights that could be used to adjust the instrument (if need be) before proceeding with the main investigation. This author confirmed that pilot testing ensures that the instrument captures appropriate and the most effective data relevant to the study. A convenient sample for this study was recruited from Ngangelizwe location which is a semi-urban residential area. Etikan, Musa and Elkassim (2016) referred to convenient sampling as a non-random sampling where the associates of the target populace meet certain practical criteria, such as easy accessibility, geographical proximity, availability at a given time, or the willingness to participate are included for the purpose of the study. In this study female respondents were targeted who had children who were five years and over; who are responsible for choosing food for their children; who prepare food and who dishes up for the

children. Female respondents who could read and write English were targeted for a purpose, hence purposive sampling was also adopted for this study. According to Etikan and Bala (2017), purposive sampling focuses on specific people with the same view to have required information and willing to share it. In this manner, pilot testing the study could facilitate judgment about the possibility of obtaining sufficient and rich data to answer the research question.

A predesigned questionnaire was used for this study. It was designed by Mawila (2004) and was applied to a Tsonga-Shangaan community in Limpopo Province to determine the knowledge of consumers as to the new food-based dietary guidelines. The predesigned questionnaire consisted of 49 questions including 10 questions relating to the Food Based Dietary Guidelines (FBDG), as indicated above. The researcher adopted and adapted the questionnaire by adding 11 open–ended statements which probed nutrition-related opinions and healthy eating components to address the objectives of the study. In 2013, this questionnaire was endorsed by experts from the Department of Life and Consumer Sciences at UNISA.

The questionnaire was piloted amongst 25 mothers with characteristics similar to those of the target group of respondents residing in the Mthatha district and sharing the same inclusion criteria adopted for the main study. Data were collected or questionnaire was piloted in a two month period, from December 2013 to end January 2014.

A group-administered questionnaire was used for pilot testing. This was deemed acceptable as Teijlingen and Hundley (2014) recommended the use of focus groups to establish the issues to be addressed in a large-scale questionnaire survey. In this way, respondents are gathered in a group, questionnaires were handed out to each volunteer respondent who then completed the questionnaire. The researcher distributed the questionnaires and was present when the respondents completed the questionnaire to ensure that the respondents understood and completed all the sections of the questionnaire. The researcher went through each exercise with the respondents until each exercise was completed by each respondent. Respondents were also encouraged to ask questions if they required clarity on statements. The pilot questionnaire was completed within 35-55 minutes. The researcher noted indistinct questions according to respondent's comments.

3.5.1 Piloting location

The pilot study was conducted in Ngangelizwe Mini hospital, which is located in a semi-urban part of Mthatha. This site was chosen as it did not form part of the main study sites. The

Ngangelizwe Mini hospital serves Ngangelizwe location and Zimbane valley communities, which are under the jurisdiction of the King Sabata Dalindyebo Municipality.

3.5.2 Pilot adjustments

After pilot testing the questionnaire, all the comments provided by the respondents were considered and the questionnaire was adjusted accordingly as recommended by Van Teijlingen and Hundley (2014). For example, these authors recommended pilot testing the wording and the order of the questions. Initially, the pilot test questionnaire for this study was divided into two sections composed of personal demographic details of the respondents in Section A, and questions relating to nutrition knowledge statements comprised a five-point Likert scale and open-ended questions on the nutritional opinions of the respondents combined in Section B. The feedback from the pilot study revealed that some of the questions in this instrument were not clearly understood by the respondents and required reconstruction. For example in Section A, which included respondents' demographic information, 0-5 years was included in the question of "Years of children at home". It was then removed as the FBDGs included in the instrument for this study was developed to promote health for South Africans older than 5 years of age. In this regard, it was discovered that this will change the inclusion criteria, thus will distort the whole study.

Furthermore, there were also two open-ended questions in Section B that needed attention. One asked "How do you go about selecting the food for the meals you prepare?" The researcher tried to adjust this question to be close to the responses of the majority but bearing in mind the aim and objectives of the study. It was changed to "Which types of food do you considered as healthy?" Another question which was poorly answered in the piloting instrument was "Are there any key role players that influence you to choose certain foods?" The researcher reconstructed as "What good nutritional practices are practised by your child?" Also question 58 "What constraints do your child encounter when applying good nutritional practices?" was collapsed, as the unit of analysis were mothers. That reduced the number of questions from 12 to 11questions.

It was also discovered that piloting the instrument helped the researcher to improve the main enquiry and allowed editing of items that caused confusion to the participants. Van Teijlingen and Hundley (2014) are of the opinion that piloting develops and tests adequacy of research instruments. Further modifications were made to separate open-ended questions to closed ended ones, as they were in the same Section B. The questions were then separated into section A and section B. The respondents' demographic information became section (C), as the respondents became bored when completing the questionnaire after they had provided

their personal information. The researcher noticed that they were no longer committed, as content questions needed more effort than personal information. However, Janghorban et al. (2013) stated that, conducting a pilot study enables judgment about the possibility of obtaining sufficient and rich data to answer the research question as well as strength of given questions in real field.

All recommendations were considered and addressed in reviewing the instrument for the main study. The final instrument used in the main study is presented in Appendix A. The main study is discussed in the following section.

3.6 THE MAIN STUDY

Research location, study sample and sampling strategy, recruitment sites for the study, data instrument, data collection procedure, the procedure followed to gather data for the main study, Problems encountered during data collection, data analysis, data quality, ethical considerations and limitations of the main study will be discussed next.

3.6.1 Research location

The research was undertaken in Mthatha and more particular in the surrounding areas of the King Sabata Dalindyebo (KSD) Local Municipality which falls under the Oliver Reginald (OR) Tambo District Municipality in the Eastern Cape Province, South Africa. The OR Tambo District Municipality (where the Municipal Health Centers are located) is one of the 7 districts of the Eastern Cape Province of South Africa. The city of OR Tambo is Mthatha in which the vast majority of its l 676 463 occupants speak isiXhosa (South African National Census, 2011). Mthatha can be found through the following coordinates: 31° 35' 10.93"S and 28° 47' 24.07"E. The researcher also lives in Mthatha and is familiar with the town and its inhabitants. The Arial map of Mthatha indicates its relation to other well-known areas such as Mthatha Dam, Mthatha Airport and Nelson Mandela Museum.

Figure 3.1: Arial map of Mthatha (Google Maps)

3.6.2 Study sample

The study sample is a representative subset of the population from which generalizations may be made about the population (Trueman, 2016). During the initial planning stages of the research, the intension was to involve all women organisations and health centres in the King Sabatha Dalindyebo Local Municipality (KSD) Mthatha district. However, due to the size of the Local Municipality, the time available to complete the research, and financial implications, it was then decided to limit the sample to the four areas where the targeted population gathered together, which encompasses all points (North, East, South and West) of the Local Municipality. However, Etikan et al. (2016) is of the opinion that, to test the whole population, the researcher would need a lot of time, energy and resources. More so, the repercussions and success of the design and related methodology have a bearing on the elements of the population and sample size considered for actual inclusion in the study.

The areas identified for this research have similar environments with regard to their geographical location. The study was conducted to include a sample of mothers residing in KSD Local Municipality, Mthatha who adhered to particular inclusion criteria. According to Ghodsi, Movaghar, Zafarghandi, Saadat, Mohammadzadeh, Fazel, Sehat, Fatemi, Khoshmohabat, Paydar, Pahlavanhosseini, Heydari, Shafaeizadeh, and Salamati (2016), inclusion criteria list characteristics that are essential when considering who to allow to

participate in the study. Thus, the inclusion criteria for mothers to take part in the study were the following:

- They should reside in Mthatha surrounding areas
- They should have one or more children older than five years of age whom they are still taking care of at home
- They should be responsible for choosing, purchasing and preparing meals at home
- They might not have children of their own at home anymore but still take care of other children at home whether it is family or friends' children whom they prepare meals for,
- Mothers who did have children but were not responsible for preparing their meals or feeding of their children were excluded from the study.

More so, in consideration to Janghorban's et al (2013) view that, piloting could assist with refining the sampling strategy and finding the most effective way to recruit participants, women were conveniently and purposefully selected based on their relative ease of access and active engagement in food choice, food preparation and feeding activities of children. Sampling strategy will be discussed in the following session.

3.6.3 Sampling strategy

Sampling strategy is the plan the researcher set forth to ensure that the sample used in the research study represents the population from which the sample is drawn (Landreneau, no date). Maheshwari (2017) is of the opinion that the purpose of sampling strategizing is to assist in selecting of units to be included in the sample. Non-probability sampling was adopted to choose units of population for this study, as it involves purposive and convenience sampling (Etikan, Musa and Alkassim, 2016) that are explained below.

Purposive sampling explained

Purposive sampling is a deliberate choice of participants due to the qualities the participants possess. The researcher decides what needs to be known and sets out to find people who can and are willing to provide the information by virtue of knowledge or experience (Etikan, Musa and Alkassim, 2016). This sampling was adopted due to the fact that the researcher had a specific group in mind thus, selection was made according to known characteristics (Rai and Thapa, 2015), which in this instance refer to the inclusion criteria applied to the mothers taking part in the study. Purposive sampling is constructed to serve a very specific need or purpose.

Convenience sampling explained

The convenience sampling is a type of nonprobability or nonrandom sampling where members of the target population that meet certain practical criteria, such as easy accessibility, geographical proximity, availability at a given time, or the willingness to participate are included for the purpose of the study (Etikan, 2016). Adedayo, (2015) confirmed that convenience sampling is a process of selecting respondents based on accessibility, ease, speed, and low cost. This study, therefore, applied the convenience sampling strategy at recruitment sites where mothers could easily be accessed. This resulted in 350 respondents being recruited to participate in this study. The sampling sites that were used are explained in the section that follows.

3.6.4 Recruitment sites for the study

Two different recruitment sites were selected. The first recruitment site is composed of the three health care centres in the urban area of Mthatha, which are main recruitment sites for this study. These health care centres were significant in that mothers would visit these sites at various times during the day, week or month for health services of various kinds ranging from family planning, children's immunisation and any other health related matters as well as where mothers would bring children for immunisation and illness. The health care centres mentioned in 1.5 were used for recruitment of respondents for the study.

Prior to the recruitment of the respondents, permission from the relevant leaders of the recruitment centres were obtained. Permission was obtained from: the Director of Clinical Governance to conduct research Mthatha Hospital Complex, the Provost and the Rector of St John's Collegiate Church and King Sabata Dalindyebo Sub District Manager of Health department for the local clinics (See appendix E). These leaders formed the gatekeepers for the recruitment of mothers who took part in the study. Mc Fadyen and Rankin, (2016) defined gatekeeper as an adult who controls or limits researcher's access to participants. For example, the top manager or senior executive in an organization, or the person within a group or community who makes the final decision as to whether to allow the researcher access to undertake the research. When obtaining the permission to approach the mothers coming to the health care centres or church, the researcher set up appropriate dates to engage with the mothers. This engagement was an opportunity to explain the study and to recruit volunteers to participate in the study. The permission letters are included in Addendum E

3.7 DATA COLLECTION INSTRUMENT

The data collection instrument assists researchers to collect quality data (Annette, 2017). Data were collected by means of a self-administered questionnaire. This type of questionnaire is

advantageous in the sense that it is less costly and time-consuming, there is no inter-interview variation, there is anonymity of the respondents, the researcher gets all of the responses within that allotted time, and is the best type of survey to get consistent responses (Debois, 2016). The disadvantage is that, it requires literate respondents and the researcher cannot observe responses during the process (Schutt, 2014)

The questionnaire consisted of three sections. After the pilot adjustments, Section A of the questionnaire was a nutrition knowledge questionnaire made up of 49 questions relating to healthy foods/ eating, food practices and food hygiene. The food-related questions incorporated the SA FBDG. The questions also included identification of snack items, water intake on a daily basis, food choice, food hygiene and food preparation techniques statements, where the respondents were required to tick in the box that best represent their answers to each statement.

Section B of the questionnaire specifically included open ended questions to measure other nutrition-related opinions of the respondents such as nutritious diet, healthy eating, eating practices and reasons for considering certain types of food as healthy. The last section C required the respondents' demographic profile such as age of the respondents, education level, marital status, employment status, income level, number of years of the children at home and the age of children at home. Singer and Couper (2017) pointed out that open-ended questions could, in fact, be utilized to probe a randomly selected subset of responses to closed-ended questions. Such probes could be used to clarify reasons for the response, clear up ambiguities, and explore responses that fell outside the expected range of answers. Eleven open ended questions, therefore were added to explore the respondents own opinion and understanding of healthy eating and basic nutrition related statements. The statements were reflective of basic nutrition knowledge: Q57, Q60; healthy eating and unhealthy food choices: Q50, 51, Q52, Q53, Q54, Q55 and opinions about good and poor nutrition practices: Q56, Q58, Q59, as well as barriers that prevent good nutrition practices for both mother and child. This formed Section B of the questionnaire. Open-ended questions were written in very basic and uncomplicated wording and spaces to write answers were provided. Section C of the questionnaire contained personal information that required the completion of information on the respondents' age, education, marital status, employment status, income, family size and ages of children in the household.

In this questionnaire Section C was the last section to be completed by the respondent which included the demographic questions of the respondents. It was decided to move this section to be the last one to avoid loss of concentration and interest in completing Section A, which

was the most important part of the questionnaire dealing with the content questions related to the main objectives of the study.

3.7.1 Measurement and Operationalization

Operationalization refers to a definition of a variable so that it can be measured and/or expressed quantitatively or qualitatively (Williamson, 2016). This process, therefore, delineates the measurement used, which is a questionnaire for this study. A questionnaire with both closed and open-ended questions was designed to explore the mothers' perspective of **nutritional knowledge**, their perception of **FBDG** and possible **influence** on **eating habits** of their children.

The summary of the structure of the self - administered questionnaire is outlined in Table 3.1. The table indicates the aspects measured in each section, and the question number as indicated in the questionnaire.

Table 3.1: Operationalisation

Objective	Question/Statement	Analysis
1. To determine mothers' perspective of basic **nutritional knowledge**	**Section A** Q1 q2 q3 q6 q7 q10 q12 q13 q14 q15 q17 q20 q21q23 q26 q27 q29 q30 q31 q32 q33 q34 q35 q36 q37 q38 q39 q40 q42 q43 q45 q46 q47 q48 **Section B** Q50; q51; q52; q53; q54; q55, q56, q57, q58, q59, q60	Factor analysis Descriptive Frequency
2. To determine mothers **perception** of **Food Based Dietary Guidelines**	**Section A** Q4,q5,q8,q9,q16,q18,q22,q24,q25,q28,q41	Factor analyses Descriptive Frequency
3. Determine the **possible influence** mothers may have on children's **eating habits**	**Section C** Respondents Profile **Section A** q11 q19 q44	Descriptive Factor analyses

Food Based Dietary Guidelines statements were included in Section A (q4,q5,q8,q9,q16,q18,q22,q24,q25,q28,q41) and the remaining 38 statements dealt with healthy eating, , food and nutrition related aspects (q1 q2 q3 q6 q7 q10 q12 q13 q14 q15 q17 q20 q21q23 q26 q27 q29 q30 q31 q32 q33 q34 q35 q36 q37 q38 q39 q40 q42 q43 q45 q46

q47 q48). These statements were considered appropriate to determine the mothers' knowledge of nutrition in general and food based dietary guideline knowledge. The 49 questions were designed to determine each respondent's own pre-knowledge about the guidelines although only 11 of these questions in fact assessed the FBDG with the remaining questions assessing other relevant healthy eating or nutrition knowledge.

In this study, a five point Likert type scale was used to measure the attitudes and the level of agreement (from strongly disagree to strongly agree) the respondents have on the 49 statements proposed to them. This is in line with Llaurad'o (2015) who indicated that use of the Likert scale allows respondents to measure attitudes and to know the degree of compliance the respondent has about any proposed information. According to Joshi, Kale, Chandel and Pal (2015), a Likert scale is a set of statements presented for a real or hypothetical situation under study where respondents are requested to show their level of agreement (from strongly disagree to strongly agree) with the given statements on a metric scale.

3.8 DATA COLLECTION PROCEDURE FOR THE MAIN STUDY

Before commencing with the main study and data collection, all procedures for permission was observed as explained in the research sites used in the study (see Section 3.5). In this study, a questionnaire called self-administrative was used to collect data from the respondents. Bolanirwa (2015) stated that, questionnaire is a data collection 'tool' for collecting and recording information about a particular issue of interest. Self-administered questionnaires enable researchers to reach a large number of potential respondents in a variety of locations. Self – administered questionnaires were distributed by two research assistants. Both of them were from Walter Sisulu University (WSU). One was a lecturer in Hospitality Management Department and the other one was a final year student from Consumer Science Education Department.

According to Cross-Cultural Survey Guidelines (2016), no interviewer involved in the self-administered completion mode, but in this study, the questionnaire were completed in the presence of the researcher. This was done because, in the first contact meeting with the respondents, some of the questionnaires were incomplete. The researcher waited for the group of respondents to complete the questionnaire (Maree & Pieterson 2010:157). In this instance, each respondent completed her own questionnaire which required self-administration in the presence of the researcher. The researcher explained the procedure to be followed by the respondents before they attempted to fill in the questionnaire. However, de Jong (2016) revealed that, if there is no one to assist the respondent in understanding instructions or to provide encouragement to complete the questionnaire, the survey quality could be distorted.

Nonetheless, the researcher should limit her own contribution to the completion of the questionnaire to the minimum, otherwise endangering reliability (Yerushalmi, Henderson, Mamudi, Singh, Lin, 2011). Data was gathered within a five month period (March – August 2014).

3.8.1 The Procedure followed to gather data for the main study

The Stanford Terrace and Civic Centre health centre staff were approached by the researcher and requested to inform mothers a week before the researcher would arrive to start data collection. The researcher and research assistants arrived at the research site at 7:00 a.m. (as per appointment dates) in order to be on time for morning prayers. The Sister in charge of the health centre introduced the researcher to the mothers when the researcher was offered a slot to introduce the research objectives and request those who are willing to participate in the study. The researcher greeted them and introduced herself to the mothers.

While mothers were waiting in the queue for health services, the researcher gave a brief introduction about the questionnaire and explained to the participants what is expected of them. The researcher went through the questionnaire with the participants until each section was completed by each of the respondents. When the respondent indicated uncertainty, the researcher read out the question for the entire group. The respondents were told to go to a separate room after health consultation to finalize the questionnaire. One of the research assistants attended them. The respondents were encouraged to ask questions from the researcher when necessary to ensure that they are able to respond to all questions as well as to clarify what was required of them. The researcher read the open -ended questions because it was discovered during the pilot study the respondents took too long to read that section. During this exercise the research assistants were checking if the respondents were completed the forms correctly. After the respondents completed the questionnaires, the researcher checked to make sure that all questions were answered. Several check points were, thus, introduced during the completion of the questionnaires to ensure that the data were usable and questionnaires were fully completed.

There were a number of respondents who did not fully understand English. The statements were translated for them by the Xhosa-speaking researcher after which they were instructed to complete Section B of the questionnaire in their Home Language. The respondents also indicated to the researcher they were more comfortable in completing the questionnaire when the statements were read to them, than when they read the statements and questions by themselves. This may be due to the literacy level of the respondents that was obstructing the self-completion of the questionnaire.

Respondents completed 87 questionnaires from the Stanford Terrace Health Centre and 104 questionnaires in the Civic Centre. On Wednesdays, questionnaires were completed at the Nelson Mandela Academic Hospital where the same procedures were followed to gather the data as by the clinics. In the Nelson Mandela Academic Hospital 96 questionnaire were completed.

A different procedure was used to recruit respondent at the church. The Church leader requested mothers to stay behind after the service, to listen to the briefing of the researcher after which the same procedure was followed to complete the questionnaires. The respondents from the church congregation completed 63 questionnaires.

3.9 DATA ANALYSIS

According to Mouton (2002:161), data are analysed to reduce the volume of available or collected data as well as to identify patterns and themes in the data. Two sources of data were identified for this study, namely a questionnaire which was referred to as a primary sources of data, and a literature review to be included in a dissertation as a secondary data source (Mouton, 2006:164). Secondary data are collected for the primary purpose of re-analysing the data, and has the advantage of compelling the researcher to be clear about the underlying assumptions and theories pertaining to the data at hand.

The data were analyzed by a statistician from WSU and verified by another statistician from the University of South Africa (UNISA) using the appropriate methods and relevant software Statistical Packages for Social Sciences (SPSS) 26.0. Kruger, De Vos, Fouche & Venter (2007: 218) indicated that analysis means the categorizing, ordering and summarizing of data to obtain answers to the research question. The responses to the questions were coded, computerized and analysed. Bless and Higson-Smith (2000: 137) argued that quantitative research often uses a range of descriptive and inferential statistical procedures. In this study, descriptive and factor analyses were used. Descriptive statistical analysis organized and arranged data in an orderly manner, particularly those from the demographic and knowledge statements in Section A and C to display results in frequency tables and graphs as presented in the next chapter. Factor analysis was used to discover patterns among the variations in values of several variables in Section B (Babbie & Mouton 2011: 472). The process of factor extraction using a pool of all the variables in the analysis led to commonalities that means the amount of variability explained by the extracted factors. The relationship between the variables led to identifying factors to explain a percentage of variability among different variables.

According to Taber (2016) Cronbach's Alpha is applied to represent the reliability, or the internal consistency, of an instrument or an instrument scale in relation to a particular sample or subsample of a population. Cronbach's alpha is usually used in studies as an indicator of instrument or scale reliability or internal consistency. A value of around 0.70 or greater is widely considered desirable. With internal consistency reliability confirmed, measures of the first six factors could be calculated for each respondent. These measures are referred to as construct scores and were calculated as the mean rating value of the rating scores for an individual on the questionnaire items that form a subset of questions. Once these scores for each individual are calculated the overall mean score for each of the six factors were calculated. These are reported in the last column of Table 4.57. Quality of data is discussed below.

3.10 QUALITY OF THE DATA

When conducting a study, it is important to obtain valid and reliable data (De Vos et al, 2005: 160). To ensure the validity and reliability of this study, the following aspects were addressed:

3.10.1 Validity

Validity expresses the degree to which a measurement measures what it purports to measure (Bolanirwa, 2015). Assalahi (2015) stated that issues such as careful sampling, appropriate instrumentation and appropriate statistical treatments of the data reflect the validity of quantitative research. In this study, validity relates to whether the questionnaire applied measures concerning the nutrition knowledge of mothers and that the open ended questions measure food and nutrition related opinions. Different types of validity measures such as face validity, content validity and construct validity (factor analysis) were adopted to make sure the instrument measures what it is supposed to measure.

Face validity

Face validity involves the expert looking at the items in the questionnaire and agreeing that the test is a valid measure of the concept which is being measured just on the face of It (Bolanirwa, 2015). As revealed by the above statement, the questionnaire was endorsed and supported the expertise from the Department of Life and Consumer Sciences at UNISA. It was further piloted prior to the main study to make sure that the questions were focused, realistic, explicit and clearly stated and could effectively solicit the desired information (Leedy and Ormrod 2013: 199). This pilot test was also used to test the presentation and significance of the questionnaires.

Content validity

Content validity relates to the degree to which the instrument fully assesses or measures the

construct of interest (Bolanirwa, 2015). The development of a content-valid instrument is typically attained by a rational analysis of the instrument by experts familiar with the construct of interest or experts on the research subject. Content validity was enhanced by involving qualified, recognized experts of the discipline to examine the study and to give their opinion on the validity of the tool.

Construct validity

Construct validity is the degree to which an instrument measures the trait or theoretical construct that it is intended to measure (Bolanirwa, 2015). This author also states that construct validity measures how meaningful the scale or instrument is when it is in practical use. In this study, factorial validity obtained as an empirical extension of content validity, because it validates the contents of the construct employing the statistical model called factor analysis.

3.10.2 Reliability

Reliability refers to the degree of similarity of results obtained when the data collection tool is repeated on the same subject or the same group (Joubert & Ehrlich 2007). Leedy and Ormrod (2005); Maree (2010) are of the opinion that reliability is the consistency with which a measuring instrument yields a certain result when the entity being measured has not changed. In this study, the questionnaire was pre-tested to sample similar characteristics to that of the study sample to determine the clarity of the data collection tool and the consistency of the responses. The feedback from the pre-test was incorporated into the questionnaire before the start of the main study. The questionnaire was exactly the same for each respondent with defined answers for the close ended questions. Subsets of closed questions were combined into groups that explain different concepts of mothers' perspective of nutrition. Determining the reliability of questionnaire, Cronbach's alpha technique was calculated that resulted in an alpha of 0.80. Furthermore, the professionals from the Department of Life and Consumer Science and I discussed and adapted the existing questionnaire. Consequently, David and Sutton (2004:171) are of the opinion that reliability can be improved by careful piloting of the question and making use of existing questions from reputable surveys.

3 .11 RESEARCH ETHICS

Research ethics refers to the application of moral principles widely accepted, and professional codes of conduct to the collection, analysis, reporting, and publication of information about research respondents, in particular active acceptance of respondents' right to privacy, confidentiality, and informed consent (Sociology Dictionary, no date). Before commencing the study, ethical approval from the relevant Institution was required. Ethics approval for this study

was obtained from the Research Ethics Committee of the College of Agriculture and Environmental Sciences, UNISA (2014/CAES/067).

However, any kind of research conducted with or about people, or their data, ethical issues should be considered (National Statement on Ethical Conduct in Human Research, 2015). In line with Child and Family Agency (2015), the rights of respondents as part of the principle of autonomy were foremost during the data collection process. Respondents were, therefore, reminded before they completed the informed consent form that participation was voluntary and that they were not forced to take part in the study, that they took part voluntarily, they were free from any coercion or undue influence, and that their rights, dignity and (when possible) autonomy was respected and appropriately protected. This is in line with recommendations of Adams, Prakobtham, Limpattaracharoen, Suebtrakul, Vutikes, Khusmith, Wilairatana, Adams and Kaewkungwal (2017) that although people have agreed to participate in research, their lives, health, dignity, and integrity must be protected, along with their right to self-determination, privacy, and confidentiality.

The informed consent (IC) process applied in this study was a process of meaningful information exchange or communication between the researcher and study respondent (Adams et al. 2017). The author revealed that, informed consent is the decision, which must be written, dated, and signed, to participate in a research, taken freely after being duly informed of its nature, significance, implications and risks and appropriately documented, by any person capable of giving consent. The researcher informed respondents about the study, so as to make an "informed" decision about partaking in the research. They (respondents) were further informed that any information they provide would remain confidential and that if they decided not to participate in the study they are free to do so. Furthermore, the IC forms made the respondents aware of the information the researcher needed from them, the reasons for seeking information, how the study will affect them, the role they will play in the study as well as the purpose of the study and information gained therefrom. The respondents were assured of anonymity and confidentiality of the study and the researcher ensured that the information will only be used for the stated purpose of the research. Having completed the questionnaire, each respondent was given a token of appreciation containing a green bar sunlight soap, dish towel, cleaning material, apple/orange, yoghurt and a sweet. The token of appreciation was not mentioned in advance to attract any respondents for the study but was given to thank the respondents for offering up their time to assist the researcher in understanding their knowledge of nutrition in relation to eating habits of their children.

3.12. CONCLUSION

In this chapter, attention was given to the design and the methodology of the research study. The study area and population were discussed, as well as the procedures for administering the research questionnaire. The site visits, discussions and observations that were undertaken and data collection was highlighted. Ethical considerations taken into account during the study have been pointed out and some constraints that the researcher was faced with have been indicated. This chapter, therefore, provides the report on the procedures taken to determine mother's understanding of nutritional practices/behaviour (good and poor), nutritional knowledge, by exploring and understanding healthy and unhealthy eating, as well as to determine Mthatha mothers' understanding of FBDGs and nutritional-related information.

CHAPTER 4

RESULTS AND DISCUSSION

4.1. INTRODUCTION

The previous chapter addressed the research design and methodology adopted to achieve the aim and objectives of this study. Data were gathered from 350 respondents of which only 328 questionnaires were used for data analysis purposes as 12 questionnaires had incomplete and missing data and were not included in the analysis. Data presented in this chapter were categorised into three main sections, namely, demographic information of the respondents, respondents' responses on healthy food and nutrition knowledge as well as respondents' healthy eating and nutrition related opinions. The results are summarised in tables for easy interpretation and understanding.

4.2 PRESENTATION OF RESULTS

A descriptive analysis of the data, factor analysis applied to the research indicators and Cronbach's alpha were used to determine the internal consistence of the analysis. Consequently, a three-way analysis of variance with interaction effects was engaged.

4.2.1 Demographic information of the respondents

The demographic information presented below focuses on the age of the respondents, education level, marital status, employment status, income level, age of the children at home and the number of children at home.

4.2.1.1 Age of the respondents

In Table 4.1 below, the age categories of respondents are presented.

Table 4.1: Age of the respondents

Age	Frequency (n=304)	Percentage %	Cumulative Frequency	Cumulative Percent
<30	84	27.63	84	27.63
31-49	150	49.34	234	76.97
50+	70	23.03	304	100.00
Frequency Missing = 24				

The results indicate that the majority (49%) of the respondents who took part in the study were between 31 and 49 years of age while about 28% included respondents younger than 30 years of age. Approximately 23% were made of respondents older than 50 years of age. The frequency indicates that information from 24 respondents was missing. The two other groups younger and oldest, falls in a critical zone regarding knowledge concerning healthy eating habits, as they might be less educated or illiterate (since the study was conducted in previously disadvantaged area). In these two latest groups (<30 and 50+) it cannot be denied among them there might be a smaller number who were better educated or experienced professionals like teachers and nurses, even university dropouts. In all for this current study all the respondents served the purpose of the study.

4.2.1.2 Education level of the respondents

The results presented in Table 4.2 indicate the education level of the respondents.

Table 4.2 Education level of the respondents

Education	Frequency (n=310)	Percent	Cumulative Frequency	Cumulative Percent
< High school	86	27.74	86	27.74
High school	139	44.84	225	72.58
> High school	85	27.42	310	100.00
Frequency Missing = 18				

The majority of the respondents had a high school level of education (45%) while about 28% of the respondents had acquired more than a high school education. 27%of respondents in this study has less than high school. Table frequency indicates that 18 respondents were missing.

The majority (45%) of respondents with high school level of education, with additional 28% of the respondents who acquired more than a high school education seemed to be the relevant group to answer the purpose of the study. Their level of education might strengthen the level of nutrition knowledge thereof. However, it was indicated in 4.2.1.1 that, there is a smaller number of respondents who were better educated and some were even university dropouts, which could be of benefit for the purpose of the study. It can be concluded, from the descriptive statistics, that the majority (45%+28%=73%) of respondents are a good sample to give data on healthy eating and nutrition related opinions explored in this study. However, although the majority (73%) of respondents who took part in this study were educated, the 2015 Vulnerable

Groups Indicator (Statistics South Africa, 2015:69) show that only 21% of African women at the national average had matric in South Africa.

4.2.1.3 Marital Status of the respondents

Table 4.3 below depicts the marital status of the respondents.

Table 4.3 Marital Status of the respondents

Marital	Frequency (n=310)	Percentage	Cumulative Frequency	Cumulative Percent
Married	63	20.32	63	20.32
Unmarried	217	70.00	280	90.32
Divorced and widow	30	9.68	310	100.00
Frequency Missing = 18				

About 70% of the respondents were unmarried, living with children in their households. This was followed by 20.3% of respondents who were married and also have children. The researcher collapsed the percentages to form two distinct groups namely; the group of married and that of unmarried respondents where the latter included divorced and widowed respondents (9.68) with children. The frequency point out that information from 18 respondents was missing.

Most of the respondents (70%) participated in this study were unmarried and have children in their households. It means they have household and childcare responsibilities and have no husband to share responsibilities with. Thus, the marital status of respondents could affect the eating and caring practices of mothers/caregivers.

4.2.1.4 Employment Status of the respondents

In Table 4.4 below, the employment Status of respondents are presented.

Table 4.4 Employment Status of the respondents

Employment	Frequency (n=304)	Percentage %	Cumulative Frequency	Cumulative Percent
Employed/part/other	116	38.16	116	38.16
Unemployed	188	61.84	304	100.00
Frequency Missing = 24				

From the results presented in Table 4.4 it is evident that the majority (62%) of the respondents were unemployed. About 38% of the respondents have some sort of employment. The latter group of respondents have no stable job and were employed as part-time workers.
This is revealed by the report on the status of women in South African economy (2015: 71), as it stated that African women are more often unemployed more than any other group in SA. The report on the status of women in South African economy (2015: 71) reported that, 29.7% of Africans women in 2015 were unemployed.

4.2.1.5 Income level of the respondents

Table 4.5 present the income level of the respondents participated in this study.

Table 4.5 Income of the respondents per month

Income	Frequency (n=198)	Percentage %	Cumulative Frequency	Cumulative Percent
<R1000	70	35.35	70	35.35
R1001-R4999	91	45.96	161	81.31
>R5000	37	18.69	198	100.00
Frequency Missing = 130				

The results in Table 4.5 indicate that the majority of respondents earned between R1001 – R4999 (46%). However, this was followed by a second large group of participants who indicated that their income was less than R1000 per month (35.35%). A smaller percentage did receive an income more than R5000 per month (27%). When considering the largest proportion of the respondents earning less than R1000 together with those earning R1001 – R4999 per month, a concern is raised whether the current income of the majority (81.31%) of the respondents can in fact support a healthy food intake. Income could significantly influenced household purchasing, food production power and household food access. Never the less, respondents stated in 4.2.1.2 above, who were noted as having knowledge of nutrition, might

not be able to apply their knowledge due to lack of financial resources. Affordability determines the availability of required food items as depicted in Figure 2.1 of this study. However, Patrick and Nicklas (2005:89) claimed that income is an important predictor of eating patterns.

4.2.1.6 Age of children at home

In Table 4.6 below, the age categories of respondents are presented.

Table 4.6 Age of children at home

Years Children	Frequency (n=303)	Percentage %	Cumulative Frequency	Cumulative Percent
6-11 years	215	70.96	215	70.96
12-18 years	49	16.17	264	87.13
18+ years	39	12.87	303	100.00
Frequency Missing = 25				

The results presented in Table 4.5 indicate that the majority (71%) of the respondents had children aged between 6 and 11 years living at home. Approximately 16.2% of respondents had children aged between 12 and 18 years. The smallest percentage (13%) of respondents had children aged between 18 years or above. 25 responses were tabled as missing.

As indicated above bout 71% respondents had 6-11 year old children in their households. This age group (middle-aged childhood) is a critical period in terms of nutritional requirements. Furthermore, Birch, Savage and Ventura (2009) opine that it is at this stage where children learn what, when, and how much to eat through direct experiences with food and by perceiving the eating behaviors of others.

4.2.1.7 Number of children at home

Table 4.7 present the number of children of the respondents participated in this study.

Table 4.7 Number of children at home

No of Children				
1-3	233	76.14	233	76.14
4-20	73	23.86	306	100.00
Frequency Missing = 22				

From Table 4.7 it can be concluded that most homes catered for between 1-3 children (76.14%). The remaining homes (23.86%) catered for a larger number (4-20) of children.

The tables above provide the summary information of the respondents' demographics. The distribution patterns for example indicate that almost 50% of the respondents are in the more mature age group of 31-50; that over 70% of the respondents had completed high school; that 70% were unmarried; and that 62% of the respondents were unemployed. The 62% unemployment and the 46% of respondents receiving between R1000 and R5000 income monthly indicated to a response group that had to budget and did not live comfortably – the poorer section of the population. Furthermore, 76% of the respondents had between 1 and 3 children to feed and 71% of these children were between the ages of 6 and 11 years.

The discussion that follows analyses the responses of respondents which was included in Section A of the questionnaire.

4.2.2 Respondents' responses of healthy food and nutrition knowledge

The following section presents data on the 49 statements that were used in the questionnaire to determine mothers' nutritional knowledge as a possible influence on the eating habits of their children. The descriptive data on each of these statements is presented in the form of a table that contain the responses as a percentage for the number of responses for each scale level option (strongly agree to strongly disagree) applied to the statement that is an indication of the attitude of the respondent towards the statement. As indicated in Chapter 3, the scales used is also an indication of the strength of the scale applied (strongly agree and agree as well as strongly disagree and disagree). The valid percentages are presented and discussed as data in this column is the percentage when the missing data is excluded from the calculations.

Statement 1: "A healthy diet should include a lot of fatty foods"

In this statement, the respondents were required to indicate their attitude towards the amount of fatty food that may be included in a healthy diet. The responses ranged from strongly agree to strongly disagree. According to table 4.8 below, 56.4% of the respondents strongly disagreed with the statement that a healthy diet should include a lot of fatty foods with a small number of the respondents agreeing with the statement (10.1%) and an even smaller number of respondents not having a specific opinion about the statement (3%). When considering the strength of the level of disagreement (between disagree and strongly disagree) with the statement, the data then reflect that the majority of the respondents were not in favour of the statement (86.9%).

The data, therefore, indicate that the majority of the participants are opposed to the inclusion of large quantities of fatty foods in the healthy diet. This is supported by the SAFBDG which states that humans should take fat sparingly (Williams, 2001; Love, et al. 2001), as high fat intake is associated with heart disease, obesity and certain types of cancer (Okeyo 2009: 26).

Table 4.8 Percentage distribution of responses to whether a healthy diet should include a lot of fatty foods

		Frequency (n=328)	Valid Percent	Cumulative Percent
Valid	Strongly Agree	9	2.7	2.7
	Agree	24	7.3	10.1
	Neutral	10	3.0	13.1
	Disagree	100	30.5	43.6
	Strongly Disagree	185	56.4	100.0

Statement 2: "I like giving my family only pap"

According to Table 4.9, the majority of respondents disagreed to strongly disagree as to giving their family only pap to eat (70.8%). A smaller percentage of the respondents agreed to strongly agreed (20.4%) to this statement while 8.4% of the respondents were neutral to the statement. In particular the SA FBDGs states that it is advised to "make starchy foods the basis of most meals" but, that it should be combined with other foods and not be the only source of food to be consumed as this may lead to a dietary imbalance. According to Faulds (2007: 15) dietary imbalance is a major contributing factor to mild and moderate malnutrition.

Table 4.9 Percentage distribution of responses to giving my family only pap

		Frequency (n=322)	Valid Percent	Cumulative Percent
Valid	Strongly Agree	27	8.4	8.4
	Agree	40	12.4	20.8
	Neutral	27	8.4	29.2
	Disagree	129	40.1	69.3
	Strongly Disagree	99	30.7	100.0
Missing n=6				

Statement 3: "It is good to drink a lot of soft drinks daily"

The responses to statement 3, presented in Table 4.10, indicates that the majority (73.2%) of respondents disagreed to strongly disagreed with the statement that it is good to drink a lot of soft drinks daily. Only 17.2% of the respondents agreed to strongly agree with the statement with 9.6% of the represents not having a particular opinion about the statement. In their review

regarding the epidemiological and clinical trial evidence in which added sugars, especially sugar-sweetened beverages (SSBs) such as soft drinks are evaluated, Malik and Frank (2015) confirmed that the consumption of SSBs caused excess weight gain and is associated with increased risk of type 2 diabetes and cardio vascular disease. This makes these beverages unique dietary contributors to obesity and related chronic diseases.

Table 4.10 Percentage distribution of responses to whether it is good to drink a lot of soft drinks daily

		Frequency (n=313)	Valid Percent	Cumulative Percent
Valid	Strongly Agree	21	6.7	6.7
	Agree	33	10.5	17.3
	Neutral	30	9.6	26.8
	Disagree	117	37.4	64.2
	Strongly Disagree	112	35.8	100.0
Missing n=15				

Statement 4: "It is important to drink a lot of water daily"

Table 4.11 present the results on the importance of drinking a lot of water daily. The results indicate that the vast majority of respondents agree to strongly agree that it is important to drink a lot of water daily (92.7%). Only a very small number of the respondents did not agree or strongly disagreed with this statement (5.5%). However, drinking adequate amounts of water on a daily basis is an important element through which overall health can be achieved as water aids digestion, circulation, absorption and even excretion of unwanted elements in the body (Sidiq, Bhat & Ara, 2016). These authors further stated clearly that, the body (of adult) needs a minimum of 1.5 to 2 litres of water (approximately 8 glasses) a day in order to function optimally, especially regarding optimal metabolic functioning of the body.

Table 4.11 percentage distribution of whether it is important to drink a lot of water daily

		Frequency (n=328)	Valid Percent	Cumulative Percent
Valid	Strongly Agree	237	72.3	72.3
	Agree	67	20.4	92.7
	Neutral	6	1.8	94.5
	Disagree	6	1.8	96.3
	Strongly Disagree	12	3.7	100.0

Statement 5: "Food such as pap or bread is required in every meal as it supplies the body with energy for the day"

The results presented in Table 4.12 indicate that the majority of the respondents agreed and strongly agreed with the statement that food such as pap or bread is required in every meal to supply the body with energy for the day. A small percentage of the respondents agreed to strongly agreed with this statement (26.7%) with only a very small number of respondents not having a particular opinion toward the statement (6.5%). The SA FBDG urge consumers to "Make starchy foods part of most meals" which is what the majority of respondents agreed to do. Currently, resistant starch with a lower GI has been noted to have positive health benefits which include improvement in colonic health and microflora, management of diabetes, blood cholesterol levels, reduced bile stone formation, increased mineral absorption and potential to modify fat oxidation (Ashwar et al 2015). On the other hand, research has considered the link between carbohydrate intake and health especially where the glycaemic index and extended energy-releasing starches or slow digestible starch are concerned.

Table 4.12 Food such as pap or bread is required in every meal as it supplies the body with energy for the day

		Frequency (n=322)	Valid Percent	Cumulative Percent
Valid	Strongly Agree	109	33.9	33.9
	Agree	106	32.9	66.8
	Neutral	21	6.5	73.3
	Disagree	50	15.5	88.8
	Strongly Disagree	36	11.2	100.0
Missing n=6				

Statement 6: "I usually put salt on my food when it is on my plate"

Table 4.13 presents data on the action of the respondents to put salt on food when it has been plated. The results suggest that the majority (86%) of respondents disagreed to strongly disagreed with this statement. Only 7.5% of the respondents agreed to strongly agree with this statement with only a very small percentage of the respondents (6.5%) not having an opinion about the statement. Mozaffarian et al (2014: 625) and Ma et al (2015) confirmed that too much salt (sodium) in the diet is harmful to health of the consumer, as a high dietary intake of salt is associated with elevated blood pressure that is a major risk factor for cardiovascular disease. However, the SAFBDG proposes that salt should be used sparingly in the diet.

Table 4.13 I usually put salt on my food when it is on my plate

		Frequency (n=322)		Valid Percent	Cumulative Percent
Valid	Strongly Agree	15		4.7	4.7
	Agree	9		2.8	7.5
	Neutral	21		6.5	14.0
	Disagree	124		38.5	52.5
	Strongly Disagree	153		47.5	100.0
		322			
Missing n=6					

Statement 7: "Your body needs alcohol to stay healthy"

The data presented in Table 4.14 indicates that the majority of the respondents (89.3%) disagreed to strongly disagree with the statement that the body needs alcohol to stay healthy. Only a very small percentage of the respondents (8.5%) agreed to disagree with this statement with even fewer respondents not having an opinion about the statement (1.9%). This is an interesting result because the vast majority of respondents in the current study were emphatic as to alcohol needs of the body. This contrasts with the SAFBDG guideline on alcohol consumption that appeared to create much confusion, especially referring to the words: "drink sensibly" (Jacobs and Steyn, 2013). As there are many other initiatives in South Africa that address alcohol abuse, it was decided to delete this guideline resulting in a technical support paper on alcohol consumption that was written to provide assistance to nutritionists and dieticians on how to deal with alcohol recommendations (Vorster, Badham and Venter 2013 S6).

Table 4.14 Your body needs alcohol to stay healthy

		Frequency (n=319)	Valid Percent	Cumulative Percent
Valid	Strongly Agree	15	4.7	4.7
	Agree	12	3.8	8.5
	Neutral	6	1.9	10.3
	Disagree	68	21.3	31.7
	Strongly Disagree	218	68.3	100.0
Missing n=9				

Statement 8: "A healthy diet should include chicken, fish, meat, eggs and cheese in large quantities"

In Table 4.15, results are presented relating to the statement that a healthy diet should include chicken, fish, meat, eggs and cheese in large quantities. The results indicate that there is very little difference between the respondents who agreed to strongly agreed (47%) and the respondents who disagreed to strongly disagreed (43.5%). A very small number of respondents were unsure about the statement (9.6%).

According to Wyness (2015), red meat continues to play an important part in the diet of humans today as it is a good source of high-quality protein as well as beneficial fatty acids and a variety of micronutrient for optimal health. Meat sources include beef, pork, lamb and game. On the other hand, Marangoni et al (2015) indicated that the consumption of poultry meat is also associated with reducing the risk of developing overweight and obesity, cardiovascular disease and type 2 diabetes mellitus as this meat is widely available, relatively inexpensive and could be beneficial to developing countries where shortfalls in essential nutrients exist. In addition Schonfeldt, Pretorius and Hall (2013) stated that, aquatic animals, unlike land animals are a good source of protein with amino acid and additional, essential fatty acids from long-chain, n-3 PUFAs group which makes it more beneficial for human health benefits. Eggs on the other hand, are an inexpensive and highly nutritious food, which provides 18 vitamins and minerals. However, some controversy still remains because of the saturated fat content and cholesterol content of eggs leading to the public being warned against frequent egg consumption that increases dietary cholesterol. This contrasts with research that indicated that egg consumption having a limited effect on blood cholesterol level and on cardio vascular disease (Miranda et al 2015). Although cheese is generally rich in saturated fat which is associated with an increased risk for cardio vascular diseases, Nilsen et al (2015) reported that they did not find increased cholesterol levels after high intake of Gouda-type cheese over an eight-week intervention. This could result in consumers considering the inclusion of cheese in their diet although the cost of cheese as a high density protein may be an influencing factor when considering including cheese in the diet.

Table 4.15. A healthy diet should include chicken, fish, meat, eggs and cheese in large quantities

		Frequency (n=313)	Valid Percent	Cumulative Percent
Valid	Strongly Agree	85	27.2	27.2
	Agree	62	19.8	47.0
	Neutral	30	9.6	56.5
	Disagree	90	28.8	85.3
	Strongly Disagree	46	14.7	100.0
Missing n= 15				

Statement 9: "A healthy diet should include a lot of vegetables and fruits daily"

Table 4.16 presents the data on the statement about a healthy diet that should include a lot of vegetables and fruits daily. From the results presented in Table 4.15 it is apparent that the vast majority of respondents (98.2%) agreed to strongly agreed that a healthy diet should include a lot of vegetables and fruits daily. A small percentage of respondents disagreed to strongly disagreed with this statement (9.8%) and none were unsure about the statement. The health benefits of fruit and vegetables are usually ascribed to the high levels of micronutrients, including antioxidants, carotenoids, flavonoids and vitamin C which are naturally developing in these foods (Fulton, McKinley, Young, Cardwell and Woodside, 2016). Moreover, Porter (2012:1) points out that there is continuous support for an increased intake of vegetables and fruit to reduce the risk of vitamin A deficiency and chronic diseases, particularly cardiovascular disease, cancers and type 2 diabetes. Therefore, increased consumption of vegetables and fruit may not only directly contribute to health benefits through increased micronutrient intake, but may also lead to a potential increase in carbohydrate and fibre intakes and a possible reduction in fat intake (Fulton et al, 2016).

Table 4.16 A healthy diet should include a lot of vegetables and fruits daily

		Frequency (n=328)	Valid Percent	Cumulative Percent
Valid	Strongly Agree	214	65.2	65.2
	Agree	95	29.0	94.2
	Disagree	13	4.0	98.2
	Strongly Disagree	6	1.8	100.0
	Total	328	100.0	

Statement 10: "It is unhealthy to be fat"

The results in Table 4.17 indicate that more respondents agree to strongly agree (53. %) that it is unhealthy to be fat than respondents who disagree to strongly disagree (37.7%). Some respondents (7.2%) were unsure about this statement. Although there are a large number of the respondents who do not think to be fat is unhealthy, Head (2015) reiterates again that by being overweight or obese increases the risk of metabolic disease, cardiovascular complications and premature death. However, the cultural reality is that South African women believe on having fat body size. This assertion is supported by Goedecke et al. (2006:72) when they state that in African culture, an overweight body has positive connotations because it symbolises beauty, happiness, affluence, health and a negative HIV/AIDS status.

Table 4.17 It is unhealthy to be fat

		Frequency (n=292)	Valid Percent	Cumulative Percent
Valid	Strongly Agree	76	26.0	26.0
	Agree	85	29.1	55.1
	Neutral	21	7.2	62.3
	Disagree	52	17.8	80.1
	Strongly Disagree	58	19.9	100.0
Missing n=36				

Statement 11: "Add bicarbonate of soda when boiling vegetables"

Table 4.18 presents the data related to the statement as to adding bicarbonate of soda to boiling vegetables. The data indicate that a larger group of respondents disagreed to strongly disagreed (45.4%) with this statement compared to the respondents who agreed to strongly agreed (31%). However, a fairly larger number of respondents than experienced in any of the previous statements were also not sure about this statement (21.9%). According to Rio (2013) cooking with bicarbonate of soda does destroy nutrients such as vitamin C, vitamin D, Riboflavin and Thiamine which might lead to poorer health. Therefore the DoH should discourage addition of bicarbonate of soda when boiling vegetables and equip the consumers with the recommended methods of cooking vegetables.

Table 4.18 Add bicarbonate of soda when boiling vegetables

		Frequency (n=319)	Valid Percent	Cumulative Percent
Valid	Strongly Agree	52	16.3	16.3
	Agree	47	14.7	31.0
	Neutral	75	23.5	54.5
	Disagree	70	21.9	76.5
	Strongly Disagree	75	23.5	100.0
			100.0	
Missing n=9				

Statement 12: "It is not necessary to limit salt when cooking"

The results presented in Table 4.19 indicate that a larger percentage of respondents (63%) disagreed to strongly disagree with the statement that it was not necessary to limit salt when cooking. A smaller percentage of the respondents (34.2%) agreed or strongly agreed with this statement with and even smaller number of respondents not sure about this statement (2.9%). In particular, Markota, Rumboldt and Rumboldt (2015) mentioned that in less developed countries the main source of salt intake happens during the cooking process and not mainly derived from industrial, processed food as experienced in developed countries. High salt intake is related with an increased risk of obesity, as it stimulates thirst and increases fluid intake and thereby increasing sugar-sweetened beverage consumption (Ma, He, and MacGregor, 2015). Markota et al (2015) reported that excessive salt intake could lead to cardiovascular risk factor, enhancing, in particular, blood pressure (BP) elevation. However, a decrease in salt consumption does not only improve the preclusion and controlling of arterial hypertension, but offers a number of additional health benefits.

Table 4.19 It is not necessary to limit salt when cooking

		Frequency n=313	Valid Percent	Cumulative Percent
Valid	Strongly Agree	76	24.3	24.3
	Agree	31	9.9	34.2
	Neutral	9	2.9	37.1
	Disagree	91	29.1	66.1
	Strongly Disagree	106	33.9	100.0
	Total	313	100.0	
Missing	n=15			

Statement 13: "Healthy foods helps us not to get sick"

Table 4.20 presents the data on statement 13 that relates to healthy food assisting a person not to get sick. The data presented in this table indicate that a large majority (88.9%) of the respondents agreed to strongly agreed with this statement. A much smaller percentage of the respondents disagreed to strongly disagreed (9.2%) with this statement and even fewer respondents were unsure (1.8%). The 2015 Dietary Guidelines for America which was reviewed from the 2010 guidelines confirmed their stance through current research "that people who consumer diets rich in fruits, vegetables, whole grains, dairy, seafood, legumes and nuts, moderate intake of alcohol, a reduction in red and processed meats and low in sugar-sweetened foods and drinks are the least likely to develop obesity and chronic diseases" (McGuire, 2016:202). This supports the idea that healthy food may minimize the risk of getting sick which also refers to chronic diseases.

Table 4.20 Healthy foods helps us not to get sick

		Frequency n=325	Valid Percent	Cumulative Percent
Valid	Strongly Agree	206	63.4	63.4
	Agree	83	25.5	88.9
	Neutral	6	1.8	90.8
	Disagree	18	5.5	96.3
	Strongly Disagree	12	3.7	100.0
	Total	325	100.0	
Missing	n=3			

Statement 14: "Soy beans are rich in protein"

Table 4.21 presents the data on respondents' opinions about soybeans being a rich source of protein. The results indicate that the majority of respondents agreed to strongly agreed (89.4%) with this statement with only a very small percentage of the respondents (5.8%) who disagreed to strongly disagreed with the statement. In addition, a small percentage of neutral respondents (4.8%) did not have an opinion. Kouris-Blazoz and Belski (2016) confirm this statement by indicating that the soybean as a legume is valued for its cost effective and rich source of protein which is higher than most other plant foods. The respondents seem to show understanding of the basic food groups which are learned from primary school level in Health Education and Natural Science, as well as at high school in Home Economics and Consumer studies and then culturally transmitted as information from generation to generation.

Table 4.21 Soybeans are rich in protein

		Frequency n=310	Valid Percent	Cumulative Percent
Valid	Strongly Agree	163	52.6	52.6
	Agree	114	36.8	89.4
	Neutral	15	4.8	94.2
	Disagree	9	2.9	97.1
	Strongly Disagree	9	2.9	100.0
	Total	310	100.0	
Missing	n=18			

Statement 15: "Drinking a lot of water is harmful to your body"

In Table 4.22 data is presented on the statement that drinking a lot of water is harmful to your body. The results indicate that the majority of respondents disagreed to strongly disagreed (72.8%) with this statement with a much smaller percentage of the respondents (24.5%) who agreed to strongly agreed with the statement. Only 2.8% of the respondents did not have an opinion about the statement. According to Kim (2012) ingesting more water than needed can increase the total blood volume which when experienced regularly may add an unnecessary burden on the heart and blood vessels. It is, therefore, necessary to point out that fluid intake does not only refer to water alone but includes fluid consumed as beverages (such as milk, tea, coffee, juice, sweetened beverages and water, the optimal beverage), water in food, and also the small volumes that are created through the breakdown of body tissue and food oxidation (Van Graan, Bopape, Phooko, Bourne, Wright HH (2013: S77).

Table 4.22 Drinking a lot of water is harmful to your body

		Frequency n=319	Val Percent	Cumulative Percent
Valid	Strongly Agree	48	15.0	15.0
	Agree	30	9.4	24.5
	Neutral	9	2.8	27.3
	Disagree	65	20.4	47.6
	Strongly Disagree	167	52.4	100.0
	Total	319	100.0	
Missing	n=9			

Statement 16: "It is healthy to be physically active"

In Table 4.23 results are presented about statement 16 which states that it is healthy to be physically active. The vast majority of respondents agreed to strongly agreed (90.2%) with the statement whereas a very small percentage of the respondents (8.8%) disagreed to strongly disagreed. An even smaller percentage were neutral regarding the statement (0.9%). Cerdá,

Pérez, Jennifer, Pérez-Santiago, Tornero-Aguilera, González-Soltero and Larrosa (2016) point out that regular physical exercise has many health benefits such as protecting against the development of chronic diseases and improving quality of life.

Table 4.23 It is healthy to be physically active

		Frequency n=316	Valid Percent	Cumulative Percent
Valid	Strongly Agree	191	60.4	60.4
	Agree	94	29.7	90.2
	Neutral	3	.9	91.1
	Disagree	13	4.1	95.3
	Strongly Disagree	15	4.7	100.0
	Total	316	100.0	
Missing	n=12			

Statement 17: "Red meat is healthier than chicken"

Table 4.24 presents data on Statement 17 which indicates that 74.7% of the respondents disagreed to strongly disagreed with the fact that red meat is healthier than chicken. A smaller percentage of the respondents agreed to strongly agreed (20.4%) with the statement. An even smaller percentage of respondents (4.9%) did not have an opinion about the statement. Boada et al (2016) and Wolk (2016) confirm that epidemiologic studies have linked the high consumption of red meat with obesity, type 2 diabetes, cardiovascular diseases, cancers and increased mortality risk. However, Wyness (2015) does indicate that if red meat is included as part of a healthy, varied diet, it does provide a rich source of high biological value protein and essential nutrients which are sometimes in short supply in the diets of some groups such as young infants, adolescents, women of childbearing age and older adults. Abete, Romaguera, Vieira, de Munain and Norat (2014) concluded following a meta-analysis of cohort studies on the association between total, processed, red and white meat (that includes chicken) consumption and cardiovascular and Isocitrate Dehydrogenase (IHD) mortality. In this regard, chicken might be a healthier alternative to red and processed meat.

Table **4.24 Red meat is healthier than chicken**

		Frequency n=304	Valid Percent	Cumulative Percent
Valid	Strongly Agree	30	9.9	9.9
	Agree	32	10.5	20.4
	Neutral	15	4.9	25.3
	Disagree	96	31.6	56.9
	Strongly Disagree	131	43.1	100.0
	Total	304	100.0	
Missing	n=24			

Statement 18: "Our diet should include a lot of different foods"

The results presented in Table 4.25 are specific to the statement that our diet should include a lot of different foods. The results indicated that 82.7% of the respondents agreed to strongly agreed with this statement whereas 13.5% of the respondents disagreed to strongly disagreed with the statement. A very small percentage of the respondents (3.8%) did not have an opinion about the statement. According to Scott (2006: 27) consuming a variety of foods increase the intake of a range of vitamins and minerals, thus preventing micronutrient deficiencies.

Table 4.25 Our diet should include a lot of different foods

		Frequency n=313	Valid Percent	Cumulative Percent
Valid	Strongly Agree	166	53.0	53.0
	Agree	93	29.7	82.7
	Neutral	12	3.8	86.6
	Disagree	24	7.7	94.2
	Strongly Disagree	18	5.8	100.0
	Total	313	100.0	
Missing	n=15			

Statement 19: "Being active has nothing to do with being healthy"

In Table 4.26, results are presented regarding Statement 19 which proposes that being active has nothing to do with being healthy. The results indicate that 67.4% of the respondents disagreed to strongly disagreed with this statement. A smaller percentage of the respondents (26.7%) agreed to strongly agreed with this statement. Botha et al (2013) define physical activity as at least 30 minutes of moderate-intensity physical activity per day for adults, and 60 minutes for children and adolescents as physical activity plays and important role in maintaining the energy balance in the body, improving body composition and promoting general health and wellbeing. Warburton and Bredin (2016) also claim that the health benefits of physical activity and exercise are undisputable and state that physical activity has a

beneficial effect on several medical conditions such as cardiovascular disease and early mortality.

Table 4.26 Being active has nothing to do with being healthy

		Frequency n=307	Valid Percent	Cumulative Percent
Valid	Strongly Agree	60	19.5	19.5
	Agree	22	7.2	26.7
	Neutral	18	5.9	32.6
	Disagree	98	31.9	64.5
	Strongly Disagree	109	35.5	100.0
	Total	307	100.0	
Missing	n=21			

Statement 20: "I prefer to eat white bread even though brown bread is healthier"

The results presented in Table 4.27 on the preference to eat white bread over brown bread even the respondent know that it is healthier, indicates that the majority of respondents disagreed to strongly disagreed (58%) with this statement. On the other hand 33.6% of the respondents agreed to strongly agreed with the statement. Only 8.5% of the respondents did not have an opinion about the statement. According to Franco (2013) brown bread made from whole wheat contain more fibre than white bread as well as greater amounts of the important nutrients such as vitamins B6 and vitamin E, magnesium, folic acid, copper, zinc and manganese. It can be argued that brown bread could be preferred for its nutritive value than the white one.

Table 4.27 I prefer to eat white bread even though brown bread is healthier

		Frequency n=319	Valid Percent	Cumulative Percent
Valid	Strongly Agree	42	13.2	13.2
	Agree	65	20.4	33.5
	Neutral	27	8.5	42.0
	Disagree	99	31.0	73.0
	Strongly Disagree	86	27.0	100.0
	Total	319	100.0	
Missing	n=9			

Statement 21: "Vegetables should be cooked in a little water for a short time"

In Table 4.28 results are presented as to whether vegetables should be cooked in a little water for a short time. The results indicate that 92% of the respondents agreed to strongly agreed with this statement with only a very small percentage of the respondents who disagreed to strongly disagreed (4.7%). A very small percentage of the respondents also remained without an opinion about the statement (2.8%). Fabbri and Crosby (2016) drew a conclusion from several studies that to enhance the availability of nutrients in vegetables, the proper method of cooking should be applied as the nutrient losses occurring in the preparation and cooking phase of vegetables is well established. The authors insisted that steaming seemed to be the proper way of cooking vegetables as this method of cooking improves total antioxidant capacity (TAC), glucosinolates, carotenoids, sulphorane and folate values.

Table 4.28 Vegetables should be cooked in a little water for a short time.

		Frequency n=322	Valid Percent	Cumulative Percent
Valid	Strongly Agree	206	64.0	64.0
	Agree	92	28.6	92.5
	Neutral	9	2.8	95.3
	Disagree	9	2.8	98.1
	Strongly Disagree	6	1.9	100.0
	Total	322	100.0	
Missing	n=6			

Statement 22: "Eating a lot of food rich in sugar daily will cause bad teeth"

The results presented in Table 4.29 on the eating of a lot of food rich in sugar daily will cause bad teeth indicates that 75.5% of the respondents agreed to strongly agreed with this statement. Only 20, 8% of the respondents disagreed to strongly disagreed with the statement and 2.8% of the respondents were neutral on this statement. Peres, Sheiham, Liu, Demarco, Silva, Assunção, Menezes, Barros, and Peres (2016) reiterate again that sugars are a well-known causal factor to dental caries.

Table 4.29 Eating a lot of food rich in sugar daily will cause bad teeth

		Frequency	Valid Percent	Cumulative Percent
Valid	Strongly Agree	153	47.5	47.5
	Agree	90	28.0	75.5
	Neutral	9	2.8	78.3
	Disagree	36	11.2	89.4
	Strongly Disagree	31	10.1	99.1
	Total	322	99.6	
Total		328		

Statement 23: " I do not care what I give my family, as long as they get their stomach full"

In Table 4.30 results are presented of Statement 23. The results indicate that 76.6% of the respondents disagreed to strongly disagreed with the statement with 13.7% of the respondents who agreed to strongly agreed with the statement. Only 8.6% of the respondents did not have an opinion about the statement. Hardcastle and Blake (2016) found in their study on mothers from an economically disadvantaged community and the factors that influence family food choices, that parents were often aware of the need to consume more healthier food but were forced by the cost of these foods and budget constraints to opt for cheaper energy dense, unhealthier food instead than the more expensive healthier foods.

Table 4.30 I do not care what I give my family, as long as they get their stomach full

		Frequency	Valid Percent	Cumulative Percent
Valid	Strongly Agree	27	8.6	8.6
	Agree	16	5.1	13.7
	Neutral	27	8.6	22.4
	Disagree	84	26.8	49.2
	Strongly Disagree	156	49.8	99.0
	Total	313	100.0	
Total		328		

Statement 24: "Drinking a lot of beer is harmful to your body"

Table 4.31 presents results on Statement 24 that indicate that the majority of respondents agreed to strongly agreed (62.6%) with the statement that drinking a lot of beer is harmful to your body. The results also indicate that a little more than a third of the respondents (36.4%) disagreed to strongly disagreed with the statement with a very small percentage of respondents (0.9%) not having an opinion about the statement. De Gaetano, Costanzo, Castelnuovo, Badimon, Bejko, Alkerwi, Chiva-Blanch, Estruch, Vecchia, Panico, Pounis, Sofi; Stranges,

Trevisan, Ursini, Cerletti, Donati, Iacoviello (2016) reiterated that the harms associated with excessive intake of beer include increased disease risk involving many organs and associated social problems such as addiction, accidents, violence and crime.

Table 4.31 Drinking a lot of beer is harmful to your body

		Frequency (n=319)	Valid Percent	Cumulative Percent
Valid	Strongly Agree	152	47.6	47.6
	Agree	48	15.0	62.7
	Neutral	3	1.0	63.7
	Disagree	19	6.0	69.5
	Strongly Disagree	97	30.4	
Missing n=9				

Statement 25: "Fish, chicken, meat and milk are good sources of protein"

Table 4.32 presents the results on whether meat, fish, chicken and milk are good sources of protein. A large percentage (88.6%) of the respondents agreed to strongly agreed with the statement with a much smaller percentage of the respondents who disagreed to strongly disagreed (5.7%) with the statement. Only 5.7% of the respondents did not have an opinion about the statement. A review of the 8th edition (2015 – 2020) Dietary Guidelines for Americans in January 2016 by Casavale, Stoody, Rihane, Olson (2016) indicated that a variety of protein foods which include seafood, lean meats and poultry, eggs, nuts and others should be included in a healthy eating pattern. On the other hand, milk is considered an important protein source in the human diet of which cow's milk is probably the most frequently consumed (Pereira, 2014).

Table 4.32 Fish, chicken, meat and milk are good sources of protein

		Frequency n=316	Valid Percent	Cumulative Percent
Valid	Strongly Agree	199	63.0	63.0
	Agree	81	25.6	88.6
	Neutral	18	5.7	94.3
	Disagree	12	3.8	98.1
	Strongly Disagree	6	1.9	100.0
	Total	316	100.0	
Missing	n=12			

Statement 26: "Eating eggs is just as good as eating meat"

Table 4.33 presents the results obtained as to whether eating eggs is just as good as eating meat. The results suggest that the majority of respondents agreed to strongly agreed (69.3%) with the statement with a smaller percentage of respondents who disagreed to strongly disagreed (20.3%) with the statement. An even smaller percentage of respondents (9.5%) did not have an opinion about the statement. According to Iannotti, Lutter, Bunn and Stewart (2014), eggs provide essential fatty acid, proteins, choline, vitamins A and B12, selenium and other critical nutrients at levels above or comparable to those found in other animal source foods and in addition to this is a relatively more affordable source of protein to the world of poor.

Table 4.33 Eating eggs is just as good as eating meat

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	103	31.4	32.6	32.6
	Agree	116	35.4	36.7	69.3
	Neutral	30	9.1	9.5	78.8
	Disagree	46	14.0	14.6	93.4
	Strongly Disagree	18	5.5	5.7	99.1
	Total	316	96.3	100.0	
Total		328	100.0		

Statement 27: "It is a good practice to eat a packet of crispy chips every day"

Table 4.34 presents the results of the responses to Statement 27 in which it is proposed that it is a good practice to eat a packet of Crispy chips every day. The results indicate that 78.2% of the respondents disagreed to strongly disagreed with this statement with a small percentage of respondents (10.4%) who agreed to strongly agreed with the statement. On the other hand, only 9.5% of the respondents did not have an opinion about the statement. According to Kraemer, de Oliveira, Gonzalez-Chica and Proença (2015) salty snack foods (such as chips) are high in sodium which when started in early childhood may lead to elevated blood pressure throughout life. Ma et al (2016) argued that a reduction in salt intake could decrease blood pressure and obesity and also reduce cardiovascular disease.

Table 4.34 It is a good practice to eat a packet of crispy chips every day

		Frequency n=312	Valid Percent	Cumulative Percent
Valid	Strongly Agree	21	6.6	6.6
	Agree	12	3.8	10.4
	Neutral	30	9.5	19.9
	Disagree	138	43.7	63.6
	Strongly Disagree	109	35.7	100.0
	Total	316	100.0	
Missing	n=12			

Statement 28: "Dried beans can be used instead of meat"

Table 4.35 presents the results of the responses to Statement 28 which proposes that dried beans can be used instead of meat. A little more than half of the respondents (59.2%) agreed to strongly agreed with the statement. On the other hand, 30.7% of the respondents disagreed to strongly disagreed with the statement while 10.1% of the respondents did not have an opinion about the statement. Messina (2014) indicated that dried beans are an important source of protein and rich in a number of micronutrients as well as in total and soluble fibre and in resistant starch which contributes to the low glycaemic index of dried beans.

Table 4.35 Dried beans can be used instead of meat

		Frequency n=306	Valid Percent	Cumulative Percent
Valid	Strongly Agree	96	31.4	31.4
	Agree	85	27.8	59.2
	Neutral	31	10.1	69.3
	Disagree	70	22.9	92.2
	Strongly Disagree	24	7.8	100.0
	Total	306	100.0	
Missing	n=22			

Statement 29: "It is necessary to put oil or fat when cooking vegetables"

Table 4.36 presents the data concerning Statement 29 that proposes that it is necessary to put oil or fat when cooking vegetables. The results in this table indicate that there is a slight majority of respondents who agreed to strongly disagreed (45.3%) with this statement followed closely by 42.7% of the respondents who disagreed to strongly disagreed with the statement. In addition, 11.1% of the respondents did not have an opinion about this statement. Khosla and Khosla (2017) suggest that the trans-fatty acids coming from hydrogenated vegetables oils such as cooking oil and hydrogenated margarine may be more harmful than foods with

natural saturated fat. It is therefore recommended to use sunflower oil, and could be used more than once, since it does not contain trans fatty acids.

Table 4.36 It is necessary to put oil or fat when cooking vegetables

		Frequency n=307	Valid Percent	Cumulative Percent
Valid	Strongly Agree	42	13.7	13.7
	Agree	97	31.6	45.3
	Neutral	34	11.1	56.4
	Disagree	76	24.8	81.1
	Strongly Disagree	55	17.9	100.0
	Total	307	100.0	
Missing	n=21			

Statement 30: "Fish is just as healthy as red meat"

Table 4.37 presents the data concerning Statement 30 in which it is suggested that fish is just as healthy as red meat. The results indicate that just over 57% of the respondents disagreed to strongly disagreed with this statement while almost half agreed to strongly agreed with the statement. Thurstan and Roberts (2014) opposed disagreement of the majority and abide with 43% of the respondents as they maintained that the inclusion of fish in the diet not only lowers the risk of cardiovascular disease, but have several benefits. For instance, Isaacs Agric & Food Secure (2016) argued that canned fish such as pilchards (sardine) is readily available and relatively inexpensive in SA local shops. Pilchard is an affordable rich source of fish protein. It can be maintained that, disagreement in this statement could be caused by lack of funds to afford meat prices and/or knowledge of fish nutritional value. Pilchard is an oily fish, which is very rich in omega-3 fatty acids, which lower triglycerides and cholesterol levels. It contains no carbohydrates, which aids to stabilize blood sugar levels; vitamins, A, B, C, D and E as well as dietary nutrients such as iron, calcium, selenium, magnesium, phosphorous, zinc and potassium. It is also one of the few foods that contain the antioxidant, Coenzyme Q10. The benefits of improved intake of these dietary nutrients may be important to prevent and/or treat sarcopenia.

Table 4.37 Fish is just as healthy as red meat.

		Frequency n=309	Valid Percent	Cumulative Percent
Valid	Strongly Agree	48	15.5	15.5
	Agree	64	20.7	36.2
	Neutral	21	6.8	43.0
	Disagree	96	31.1	74.1
	Strongly Disagree	80	25.9	100.0
	Total	309	100.0	
Missing	n=19			

Statement 31: "Our daily diet should include vegetables and starch only"

Table 4.38 presents the data concerning Statement 31 that suggests that our daily diet should include vegetables and starch only. Half of the respondents (51%) agreed to strongly agreed with the statement with 41.6% of the participants disagreeing to strongly disagreeing. Only 6.3% were neutral regarding the statement. Simpson, Le Couteur and Raubenheimer (2015) pointed out that the most prominent health message is to eat a balanced diet which, in this instance, does not mean only the inclusion of vegetables and starch. The responses of respondents gave the researcher the impression that the majority (51%) might be practicing a vegetarian diet. However, Craig (2009) suggested that a vegetarian diet is associated with many health benefits because of its higher content of fibre, folic acid, vitamins C and E, potassium, magnesium, and many phytochemicals and a fat content that is more unsaturated. None the less, this type of diet is not favoured by SA as meat consumption is regarded as a must especially for lunch or super. Popular as it is, Viljoen (2009) opines that adjustments had to be made because meat is too expensive to eat every day as the amount of money available determines the frequency of what foods could be purchased.

Table 4.38 Our daily diet should include vegetables and starch only

		Frequency n=286	Valid Percent	Cumulative Percent
Valid	Strongly Agree	88	30.8	30.8
	Agree	58	20.3	51.0
	Neutral	18	6.3	57.3
	Disagree	86	30.1	87.4
	Strongly Disagree	33	11.5	100.0
	Total	286	100.0	
Missing	n=42			

Statement 32: "Vegetables cooked in little water protects us against illnesses more than vegetables cooked for a long time in much water"

In Table 4.39 the results are presented of Statement 32. This statement indirectly questions the nutritional value of vegetables prepared in more water for a long time against vegetables prepared in little water and its contribution to protecting a person against illness. The results indicate that the majority of respondents agree to strongly agreed (84.7%) with the statement and lean towards less water in which vegetables should be prepared will be more beneficial to health than cooking vegetables for a long time in more water. Only 11.4% of the respondents disagree to strongly disagree with this statement and 2.9% of the respondents did not have an opinion about the statement. The respondents are in line with Bongoni, Verkerk, Dekker & Steenbekkers (2014) who noticed that Dutch consumers were health orientated as they prepare vegetables in less water and for a short period of time to preserve the nutrients. Thus Fabbri and Crosby (2016) revealed that the method of preparation applied to different vegetables such as broccoli, potatoes, green beans, peas and other, greatly affects the content of nutrients.

Consequently, the respondents contradicted to their positive responses because, they could not achieve the recommended vegetable preparatory techniques due to social, economic and environmental factors. To cite one, the outbreak of Listeriosis specifically diverted the minds of food preparers in this way: they have to wash vegetables and fruit repeatedly; to cook vegetables at high heat to kill off the bacterium, listeria monocytogenes. It can be assumed that the aforesaid precautionary measures of combating Listeriosis are detrimental to the nutritive value of vegetables. None the less, Tian, Chen, Ye, Chen (2016) highlighted that the fact that domestic cooking methods of vegetables lead to biological, physical and chemical modifications to the vegetables which lead to sensory, nutritional and textural changes of the vegetables, may be beneficial or detrimental to human health.

Table 4.39: Vegetables cooked in little water protects us against illnesses more than vegetables cooked for a long time in more water

		Frequency n=307	Valid Percent	Cumulative Percent
Valid	Strongly Agree	160	52.1	52.1
	Agree	100	32.6	84.7
	Neutral	9	2.9	87.6
	Disagree	17	5.5	93.2
	Strongly Disagree	18	5.9	100.0
	Total	307	100.0	
Missing	n=21			

Statement 33: "Brown sugar is better than white sugar"

Table 4.40 presents the data of Statement 33 in which brown sugar is compared to white sugar as being better or not. The majority of respondents (84.9%) indicated that they agree to strongly agree with this statement, with a very small percentage of respondents (7%) disagree to strongly disagree with the statement and another equally small percentage of the respondents (7%) not having an opinion about the statement. It is of interest that Dickson-Dickson-Spillmann, Siegrist, & Keller (2011) also found in their study on nutrition knowledge amongst Swiss consumers that consumers were inclined to believe that brown sugar was healthier than white sugar. However, WHO Press Release (2015) indicates that reducing free sugars to less than 10% of total energy intake decreases the risk of overweight, obesity and tooth decay. Consequently, if countries can be committed in decreasing the amount of sugar intake, the burden of noncommunicable diseases could be reduced.

Table 4.40: Brown sugar is better than white sugar

		Frequency n=298	Valid Percent	Cumulative Percent
Valid	Strongly Agree	151	50.7	50.7
	Agree	102	34.2	84.9
	Neutral	21	7.0	91.9
	Disagree	3	1.0	93.0
	Strongly Disagree	18	6.0	100.0
	Total	298	100.0	
Missing	n=30			

Statement 34: "Dried beans are a cheap alternative to meat"

The results of Statement 34 is captured in Table 4.41. The majority of the respondents agree to strongly agree (66.1%) with the statement that dried beans are a cheap alternative to meat. A smaller percentage (17.9%) of the respondents disagree to strongly disagree with the statement while 15% of the respondents did not have an opinion about the statement. Joshi and Kumar (2015) point out that a meat-based diet requires a significantly greater amount of environmental resources compared to a more grain-based diet (which include legumes) as the amount of resources required to support meat production is also far higher than grain production. Resulting from this is the fact that legumes become a cheaper source of protein to the consumer. In addition to this Jallinoja, Niva, Latvala (2015) suggest that the transition to include more plant-based protein sources (which legumes provide) amongst Finnish consumers would only take effect if the new meanings and competencies related to preparing and eating legume-based dishes occurs which will only be successful if a new food culture

emerges out of the consumption patterns of the consumers. They're high in dietary fiber, low in fats and usually contain no cholesterol (Sandi Busch nodate). Pauli (2017) maintained that dried beans last indefinitely, that is, around one year in proper storage conditions without the need of refrigerator.

Table 4.41: Dried beans are a cheap alternative to meat

		Frequency n=307	Valid Percent	Cumulative Percent
Valid	Strongly Agree	126	41.0	41.0
	Agree	77	25.1	66.1
	Neutral	46	15.0	81.1
	Disagree	40	13.0	94.1
	Strongly Disagree	15	4.9	100.0
	Total	307	100.0	
Missing	n=21			

Statement 35: "It is not necessary to cover a bucket of clean water"

The results in Table 4.42 indicate that the majority of respondents disagree to strongly disagree with the statement that it is not necessary to cover a bucket of clean water. Anon (2017) indicates that by storing water in an open container mosquito larvae, algae and various other life forms are able to grow in the water.

Table 4.42: It is not necessary to cover a bucket of clean water

		Frequency n=307	Valid Percent	Cumulative Percent
Valid	Strongly Agree	49	16.0	16.0
	Agree	4	1.3	17.3
	Neutral	3	1.0	18.2
	Disagree	70	22.8	41.0
	Strongly Disagree	175	57.0	100.0
	Total	307	100.0	
Missing	n=307			

Statement 36: "I only buy food that is cheap"

In Table 4.43 results are presented that address Statement 36. Although the majority of respondents (50.6%) disagree to strongly disagree with this statement a fairly large percentage of the respondents (24.8%) do agree to strongly agree with this statement with another fairly large percentage of respondents (20.5%) not having an opinion about the statement. Darmon and Drewnowski (2015) highlighted that foods of lower nutritional value as well as lower-quality

diets followed by consumers generally cost less and tend to be selected by groups of lower socioeconomic status where food budgets do not allow for optimum dietary practices. Temple et al (2011) also confirmed the cost of healthier food options within the South African rural context as being more expensive than commonly consumed foods, as a result making healthy diets unaffordable for the large majority of the population in South Africa from rural settings. Rao et al (2015) also draw attention to the fact that one of the most common barriers to eating healthy is cost in which instance healthier foods and diets are considered more costly which means that the healthier food option may not be in reach of the consumer who cannot afford this option.

Table 4.43: I only buy food that is cheap

		Frequency n=312	Valid Percent	Cumulative Percent
Valid	Strongly Agree	36	11.5	11.5
	Agree	40	12.8	24.4
	Neutral	75	24.0	48.4
	Disagree	64	20.5	68.9
	Strongly Disagree	94	30.1	99.0
	Total	312	100.0	
Missing	n=16			

Statement 37: "Vegetables and Fruit help to protect the body"

The results of Statement 37 are presented in Table 4.44. The results indicate that a large majority of the respondents (92%) agree to strongly agree with the statement that vegetables and fruit help to protect the body. A very small percentage of the respondents (6.1%) disagree to strongly disagree with the statement, whereas 1% of the respondents not having an opinion about the statement. Fulton, McKinley, MC Young, IS Cardwell, CR & Woodside, (2016) has provided evidence in the systematic review and meta-analysis of the impact of fruit and vegetable consumption had an impact on diet profile that by increasing fruit and vegetable consumption, micronutrient intake increases, energy intake stays the same, carbohydrate and fibre intake seem to increase, whilst total fat may decrease which is likely to lead to the improvement in the overall diet profile of the consumer but have related health benefits based on the positive effect it has on carbohydrate, fibre and fat levels.

Table 4.44: Vegetables and Fruit help to build up the body

		Frequency n=312	Valid Percent	Cumulative Percent
Valid	Strongly Agree	204	65.4	65.4
	Agree	83	26.6	92.0
	Neutral	3	1.0	92.9
	Disagree	10	3.2	96.2
	Strongly Disagree	9	2.9	100.0
	Total	312	100.0	
Missing	n=16			

Statement 38: "It is healthy to take alcoholic drinks daily"

In table 4.45 the results of Statement 38 are presented about whether it is healthy to take alcoholic drinks daily. The results indicate that 88.7% of the respondents disagree to strongly disagree with this statement. Only 7.2% of the respondents agree to strongly agree with the statement with 4.1% of the respondents not having an opinion about the statement. Chikritzhs Stockwell, Naimi, Andreasson, Dangardt, & Liang (2015) are in fact now claiming that the foundations of the hypothesis for the protective effect of low-dose alcohol consumption cannot be accepted anymore because alcohol in general is a leading cause of health problems with no randomized studies that can be found in support of any protective effects of low dose consumption of alcohol.

Table 4.45: It is healthy to take alcoholic drinks daily

		Frequency n=291	Valid Percent	Cumulative Percent
Valid	Strongly Agree	12	4.1	4.1
	Agree	9	3.1	7.2
	Neutral	12	4.1	11.3
	Disagree	77	26.5	37.8
	Strongly Disagree	181	62.2	100.0
	Total	291	100.0	
Missing	n=37			

Statement 39: "Drinking a lot of fruit juice is harmful to your body"

Table 4.46 represents the data on Statement 39 which poses the question whether it is harmful to drink a lot of fruit juice. The majority of the respondents (52.1%) disagree to strongly disagree with this statement indicating that they don't think drinking a lot of fruit juice is harmful to the body. However, 31.4% of the respondents agree to strongly agree with this statement with 16.5% of the respondents not having an opinion on the statement. From these results it

does seem as if the respondents might not be too sure about the effect of fruit juice on the body. To this effect, Imamura, Connor, Ye, Mursu, Hayashino, Bhupathiraju, Forouhi (2015) found that especially sugar sweetened beverages and fruit juices in general were both positively associated with incident type 2 diabetes and therefore not healthy option for the prevention of type 2 diabetes. On the other hand a review conducted by Hyson (2015) on the association between the consumption of pure fruit juice and human health concluded that there might be some potential health-related and disease prevention markers associated with the consumption of pure fruit juice as part of a balanced diet that should not be overlooked. However, the authors concluded that from the literature reviewed there was no real understanding of the relationship between pure fruit juice and human health requiring more well-controlled clinical trials to be conducted to provide clarity regarding this relationship.

Table 4.46: Drinking a lot of fruit juice is harmful to your body

		Frequency n=309	Valid Percent	Cumulative Percent
Valid	Strongly Agree	55	17.8	17.8
	Agree	42	13.6	31.4
	Neutral	51	16.5	47.9
	Disagree	65	21.0	68.9
	Strongly Disagree	96	31.1	100.0
	Total	309	100.0	
Missing	n=19			

Statement 40: "A healthy diet should consist of many foods containing a lot of sugar"

The results of Statement 40 are presented in Table 4.47. The results indicate that the majority of respondents (69.9%) disagree to strongly disagree with the statement that a healthy diet should consists of many foods containing a lot of sugar. A smaller percentage of the respondents (24.4%) agree to strongly agree with this statement whereas 5.8% of the respondents did not have an opinion about the statement. Popkin and Hawkes (2016) and Vasanti and Frank (2015) profess that excessive intake of added sugars (such found in many foods containing sugar) has adverse effect on cardio metabolic health. This is supported by DiNicolantonio et al (2015) who also mention that added fructose in particular (for example sucrose and high-fructose corn syrup) may pose the greatest problem for incident diabetes, diabetes-related metabolic abnormalities (as indicated in statement 39) but also cardiovascular risk.

Table 4.47: A healthy diet should consist of many foods containing a lot of sugar

		Frequency n=312	Valid Percent	Cumulative Percent
Valid	Strongly Agree	18	5.8	5.8
	Agree	58	18.6	24.4
	Neutral	18	5.8	30.1
	Disagree	118	37.8	67.9
	Strongly Disagree	100	32.1	100.0
	Total	312	100.0	
Missing	n=16			

Statement 41: "It is not healthy to eat lots of fat"

In Table 4.48 the results of Statement 41 is presented on whether it is healthy to eat lots of fat. The results indicate that 61% of the respondents agree to strongly agree that it is not healthy to eat lots of fat. A smaller percentage of the respondents (36.2%) disagree to strongly disagree with this statement whereas 1.9% of the respondents did not have an opinion about the statement. Fatty acids associated with the word fat as used in Statement 41 influences health as the impact of fatty acids related to cardiovascular disease and its influence on metabolic diseases such as type 2 diabetes, inflammatory diseases and cancer have been established (Calder, 2015). However, Dehmer, Pereira, Schmidt, Alvim, Lotufo, Luft, and Duncan (2016) have found that full-fat dairy food intakes are inversely and independently associated with metabolic syndrome (MetSyn) (which is a clustering of interrelated risk factors for cardiovascular disease and type 2 diabetes mellitus) in middle-aged and older Brazilian adults, of which these associations are mediated by dairy saturated fatty acids therefore the findings do not recommend the avoidance of full-fat dairy intake as full-fat dairy improves MetSyn characteristics.

Table 4.48: It is not healthy to eat lots of fat

		Frequency	Valid Percent	Cumulative Percent
Valid	Strongly Agree	122	39.4	39.4
	Agree	67	21.6	61.0
	Neutral	6	1.9	62.9
	Disagree	25	8.1	71.0
	Strongly Disagree	87	28.1	100.0
	Total	310	100.0	
Total		328		

Statement 42: "Vegetables must be cooked in a lot of water for a long time"

Table 4.49 present the results of Statement 42 which poses the question whether vegetables must be cooked in a lot of water for a long time or not. The results indicate the 87.3% of the respondents disagree to strongly disagree with this statement. Only 8.7% of the respondents agree to strongly agree with the statement with 4% of the respondents not having an opinion about the statement. Some facts on the effect of cooking of vegetables were discussed under Statement 32. However, Miglio et al (2008) also found that water-cooking treatments such as boiling and steaming better preserved the antioxidant compounds, particularly carotenoids in all vegetables analysed in the study and ascorbic acid in carrots and courgettes with steamed vegetables maintaining a better texture quality than boiled vegetables and showed limited discoloration. Steaming was also found to increase the concentration of polyphenols and antioxidants in vegetables (Dolinsky et al, 2016). This implies that the way in which vegetables are prepared may have an effect on the preservation of the nutritional quality of the vegetables.

Table 4.49: Vegetables must be cooked in a lot of water for a long time

		Frequency n=298	Valid Percent	Cumulative Percent
Valid	Strongly Agree	13	4.4	4.4
	Agree	13	4.4	8.7
	Neutral	12	4.0	12.8
	Disagree	73	24.5	37.2
	Strongly Disagree	187	62.8	100.0
	Total	298	100.0	
Missing	n=30			

Statement 43: "Starchy food supplies the body with energy"

In Table 4.50 the results of Statement 43 are presented which makes the statement that starchy food supplies the body with energy. The majority of respondents (65.8%) agree to strongly agree with the statement. A small percentage of the respondents (18.5%) disagree to strongly disagree with the statement whereas 13.8% of the respondents did not have an opinion about the statement. According to the British Nutrition foundation (2017 https://www.nutrition.org.uk/healthyliving/basics/carbs.html) starchy foods should be the main source of energy which include bread, rice, pasta, potatoes and other foods and grains. According to Vorster (2013) the Food-Based Dietary messages for South Africa recommend that starchy foods should form part of most meals in the South African diet by eating minimally processed or whole grains, legumes and root vegetables rather than as refined starches and sugars (Vorster, 2013) (South African Journal of Clinical Nutrition 2013:26(3) supplemented.

Table 4.50: Starchy food supplies the body with energy

		Frequency n=304	Valid Percent	Cumulative Percent
Valid	Strongly Agree	94	30.9	30.9
	Agree	106	34.9	65.8
	Neutral	42	13.8	79.6
	Disagree	26	8.6	88.2
	Strongly Disagree	30	9.9	100.0
	Total	304	100.0	
Missing	n=24			

Statement 44: "Our daily diet should include foods of one type, e.g. starch only"

Table 4.51 presents the data on Statement 44 regarding the inclusion of one type of food in our daily diet such as starch only. The majority of respondents (77.5%) disagree to strongly disagree with this statement. A small percentage of the respondents (19.5%) agree to strongly agree with the statement whereas a very small percentage (2.9%) of the respondents do not have an opinion about the statement. Labadarios et al (2011) pointed out that the more food groups included in the daily diet the greater the likelihood of meeting nutrient requirement which refers to dietary diversity as consuming a diverse range of foods can enhance vitamin and mineral supplies and expose the individual to a wide range of nutritive food components to meet energy and nutritional requirements (Alkerwi, 2014) as no single food can contain all nutrients (Taruvinga, Muchenje & Mushunje, 2013).

Table 4.51: Our daily diet should include foods of one type, e.g. starch only

		Frequency n=307	Valid Percent	Cumulative Percent
Valid	Strongly Agree	27	8.8	8.8
	Agree	33	10.7	19.5
	Neutral	9	2.9	22.5
	Disagree	91	29.6	52.1
	Strongly Disagree	147	47.9	100.0
	Total	307	100.0	
Missing	n=21			

Statement 45: "Cooked vegetables must be left lying in water after they are cooked"

Table 4.52 represents the data on Statement 45 which proposes that cooked vegetables must be left lying in water after they are cooked. The majority of the respondents (82.2%) disagree to strongly disagree with this statement. A small percentage of the respondents (12.8%) agree to strongly agree with the statement with only 3.9% of the respondents who do not have an

opinion about the statement. Myeza et al (2015) point out that soaking vegetables for a long period of time could affect the nutrients contained though it is a preferred method to prepare some vegetables for cooking. However Leahu and Rosu (2014) do suggest that folic acid can be lost from dried beans as well as other vegetables during the soaking process.

Table 4.52: Cooked vegetables must be left lying in water after they are cooked

		Frequency n=304	Valid Percent	Cumulative Percent
Valid	Strongly Agree	27	8.9	8.9
	Agree	12	3.9	12.8
	Neutral	12	3.9	16.8
	Disagree	94	30.9	47.7
	Strongly Disagree	156	51.3	99.0
	Total	304	100.0	
Missing	n=24			

Statement 46: "Water drawn from rivers, dams and wells has to be boiled before use"

The results in Table 4.53 indicate that the majority of the respondents (90.2%) agree to strongly agree with the statement that water drawn from rivers, dams and wells has to be boiled before use. A very small percentage of the respondents (7.9%) disagree to strongly disagree with this statement whereas only 1.9% of the respondents did not have an opinion about the statement. According to the World Health Organisation (2017) water from these sources should be boiled to eradicate all pathogenic organisms and to make the water safe for consumption.

Table 4.53: Water drawn from rivers, dams and wells has to be boiled before use

		Frequency n= 316	Valid Percent	Cumulative Percent
Valid	Strongly Agree	211	66.8	66.8
	Agree	74	23.4	90.2
	Neutral	6	1.9	92.1
	Disagree	9	2.8	94.9
	Strongly Disagree	16	5.1	100.0
	Total	316	100.0	
Missing	n=12			

Statement 47: "Starchy food should make the basis of my meal"

The results in Table 4.54 indicate that the majority of the respondents (52.2%) disagree to strongly disagree with the statement that starchy food should make the basis of my meal. However, 38.3% of the respondents agree to strongly agree with this statement with only 9.1% of the respondents not having an opinion about the statement. According to the Food-Based Dietary messages for South Africa, discussed by Vorster (2013) starchy food discussed under statement 43 should form part of most meals in South Africa.

Table 4.54: Starchy food should should make the basis of my meal

		Frequency n=298	Valid Percent	Cumulative Percent
Valid	Strongly Agree	69	23.2	23.2
	Agree	45	15.1	38.3
	Neutral	27	9.1	47.3
	Disagree	81	27.2	74.5
	Strongly Disagree	76	25.5	100.0
	Total	298	100.0	
Missing	n=30			

Statement 48: "It is healthier to eat an apple instead of sweets"

The results in Table 4.55 indicate that 91.1% of the respondents agree to strongly agree with the statement that it is healthier to eat an apple instead of sweets. Only 7.9% of the respondents disagree to strongly disagree with this statement and 0.9% of the respondents did not have an opinion about the statement. In this regard it is prudent to refer to the Dietary Guidelines for Americans that Frank et al (2016) discuss in which Americans are advised to replace sweets and sugary snack with healthier options such as fruit as the naturally occurring sugars in fruits are locked together with beneficial vitamins, minerals and fibre as well as being a low kilojoule option than a serving of fruit juice or a sweet treat.

Table 4.55: It is healthier to eat an apple instead of sweets

		Frequency n=316	Valid Percent	Cumulative Percent
Valid	Strongly Agree	217	68.7	68.7
	Agree	71	22.5	91.1
	Neutral	3	.9	92.1
	Disagree	9	2.8	94.9
	Strongly Disagree	16	5.1	100.0
	Total	316	100.0	
Missing	n=12			

Statement 49: "Fried food is healthier than boiled food"

In Table 4.56 the results of Statement 49 are presented in which the statement is made that fried food is healthier than boiled food. The majority of respondents (73.8%) disagree to strongly disagree with this statement. A smaller percentage of the respondents (25.2%) agree to strongly agree with the statement while only 1% of the respondents did not have an opinion about the statement. A study done by Ares et al (2015) on the consumers' associations with wellbeing in a food-related context: a cross-cultural study amongst consumers from Brazil, Franc, Portugal, Spain and Uruguay indicated that consumers were of the opinion that fried foods were harmful to their wellbeing. A review performed by Gadiraju et al (2015) on the evidence of the relationship between fried food consumption and cardiovascular health indicated that the more frequent consumption of fried foods is associated with a higher risk of developing type 2 diabetes, obesity and hypertension.

Table 4.56: Fried food is healthier than boiled food

		Frequency n=310	Valid Percent	Cumulative Percent
Valid	Strongly Agree	33	10.6	10.6
	Agree	45	14.5	25.2
	Neutral	3	1.0	26.1
	Disagree	73	23.5	49.7
	Strongly Disagree	156	50.3	100.0
	Total	310	100.0	
Missing	n=18			

4.3 FACTOR ANALYSIS

Factor analysis operates on the basis that measurable and observable variables can be condensed to fewer latent variables that share a common variance and are unobservable, which is known as reducing dimensionality (Yong and Pearce, 2013). Factor analysis was used in this study to summarize the data obtained, so that the relationships and patterns of the data could be easily interpreted and understood. According to Jolliffe & Cadima (2016), Principal Component Factor Analysis (PCFA) is the most suitable analytical method to reduce the data obtained from the statements the respondents supplied and to then reserve as much statistical information or variability as possible from the data. This method allowed the researcher to find new variables that represented the underlying or latent variables of the data set, which are referred to as the factors that best describe the ideas that depict mothers' nutritional knowledge. The PCFA performed on the 49 statements provided from the nutrition knowledge questionnaire allowed the grouping of correlating answers into sub-sets of correlating questions (statement 1 – statement 49) (O'Brien et al, 2017). To decide on the optimum number of factors, several factor analyses were undertaken that allowed extraction of a number, as can be seen in Figure 4.1, Using this approach, the results of the scree plot (Figure 4.1) and other criteria such as eigenvalues greater than one and cumulative variance explained by increasing numbers of factors included in the factor model; and the interpretability of extracted factors were used to guide choice of the appropriate number of factors to be included in the model of choice; or best fit model.

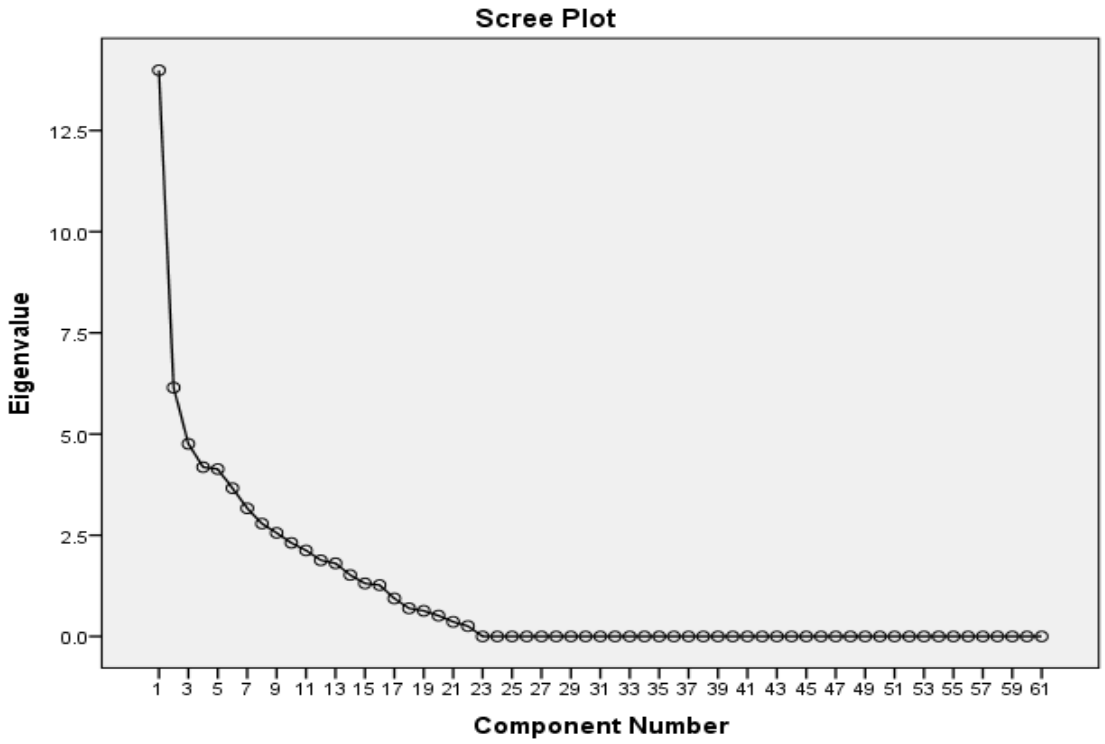

Figure 4.1: Scree plot of the number of factors extracted

The scree plot (Figure 4.1) for the data set gave a more gradual slope indicating that between 5 and 14 factors that best fit the model. The scree plot can be considered a test in which the graph of the Eigen values are examined to look for the natural bend or break point in the data where the curve flattens out of which the number of data points above the break is usually the number of factors to retain (Osborne & Costello, 2009). A summary of a number of analyses are included in the results section (Table 4.55). In this study, 49 statements from the questionnaire were used stemming from a sample size (N) of 328 respondents. However, due to missing values, 12 questionnaire items (statements) were eventually excluded from PCFA which left 37 questionnaire items (statements) in the analysis. In factor analysis, variables that 'load' onto more than one factor are excluded from the analysis (Yong and Pearee, 2013). As a result, the analysis was rerun with the reduced number of variables in the subsequent analysis. Since factor analysis is only conducted on sets of observations without missing values, the analysis programmatically excluded cases (statements) where some values of these variables were missing. The factor analysis which extracted seven factors was deemed the best fit for the data for this study. The table below reports on the eigenvalues (first column), variance explained (proportions column) and the cumulative variance explained if 1, up to 15 factors are extracted by the analysis (that remaining entries up the 37 factors are not included because their contribution to explained variance and cumulative variance becomes negligible).

The Cumulative column indicated that by extracting seven factors about 72% of the variation in the data is explained. This was considered as an acceptable criterion for this study. The seven factors extracted by the factor analyses are aspects that the subsets of questions address or are linked with and were described as ideas or perceptions related to:

Factor 1 - Knowledge of healthy food and lifestyle

Factor 2 – Informed of unhealthy food choices and lifestyle

Factor 3 – Nutrition knowledge gap

Factor 4 – Distinctive healthful choices

Factor 5 – Limited general health knowledge

Factor 6 – Food custom deviation

Table 4.55 below summarizes the results of factor analyses. According to this table, the criterion used to include a factor was if its Eigenvalue was greater than 1.2. If an indicator had an Eigenvalue less than 1.2, it was not significant to qualify as a factor. Accordingly, only seven indicators qualified to be factors.

Table 4.57: Eigenvalues (first column), variance explained (proportions column) and the cumulative variance explained if 1, up to 15 factors are extracted by the analysis

Eigenvalues of the Reduced Correlation Matrix: Total = 26.2232583 Average = 0.74923595 (N = 328; N(used) = 163)				
	Eigenvalue	**Difference**	**Proportion**	**Cumulative**
1	6.60601251	2.68733627	0.2519	0.2519
2	3.91867625	1.57834202	0.1494	0.4013
3	2.34033422	0.50394515	0.0892	0.4906
4	1.83638908	0.22359522	0.0700	0.5606
5	1.61279385	0.27637359	0.0615	0.6221
6	1.33642027	0.11496983	0.0510	0.6731
7	1.22145043	0.06491402	0.0466	0.7197
8	1.15653641	0.11091140	0.0441	0.7638
9	1.04562502	0.12385468	0.0399	0.8036
10	0.92177033	0.11651163	0.0352	0.8388
11	0.80525870	0.01392162	0.0307	0.8695
12	0.79133709	0.07647695	0.0302	0.8997
13	0.71486014	0.07314144	0.0273	0.9269
14	0.64171870	0.18839429	0.0245	0.9514
15	0.45332441 etc – up to 37 eigenvalue	0.05335913	0.0173	0.9687

Table 4.57 reports on the factor loadings of the 37 nutrition knowledge variables on the six factors extracted in the factor analysis of best fit. These nutrition knowledge variables are considered to contribute towards explaining a factor if a loading of greater than 0.4 is reported. Such values are indicated with an asterix in Table 4.56 below.

The subset of questions which comprise each factor (for example factor one is explained by the questions, q4 q6 q14 q16 q21 q25 q26 q32 q38 q45 q48) were considered and the concept/ or aspect which these subset of questions address were described as perceptions regarding 'Knowledge of healthy food and lifestyle. Similarly the next five factors were labelled as perceptions that portray 'Nutrition knowledge gap: q20 q23 q29 q36 q40 q45 q47'; 'Informed of unhealthy food choices and lifestyle: q3 q28 q34 q43; 'Distinctive healthful choices: q1 q19 q31 q12'; and perceptions that indicate the idea that 'Limited general health knowledge: q41 q24' and the sixth factor is labelled, 'Food custom deviation: q11 q44 q2'.

Table 4.58: The factor loadings of the 37 nutrition knowledge variables on the six factors extracted in the factor analysis of best fit. (The seventh factor is nullified but could not be deleted as it distorts the whole table when deleted)

Principal Component factor analysis (promax rotation) : Rotated Factor Pattern (Standardized Regression Coefficients)														
	Factor1		Factor2		Factor3		Factor4		Factor5		Factor6		Factor7	
	Knowledge of healthy food and lifestyle		Informed of unhealthy food and lifestyle		Nutrition knowledge gap		Distinctive healthful choices		Limited general health knowledge		Food custom deviation		Unnamed	
q16	0.80	*	-5		-10		7		25		5		-5	
q48	0.76	*	-1		-2		4		5		-10		38	
q25	0.74	*	-2		26		12		-4		-1		-25	
q21	0.72	*	1		15		13		15		-13		-9	
q26	0.62	*	33		4		-22		-17		-8		9	
q32	0.57	*	-10		1		8		33		6		6	
q4	0.50	*	-13		29		11		6		0		35	
q14	0.50	*	-11		31		22		-21		25		-12	
q10	-25		-2		22		-20		12		9		22	
q45	-0.41	*	42	*	7		33		20		11		10	
q6	-0.61	*	25		15		6		9		1		-18	
q38	-0.61	*	37		8		4		8		9		23	
q20	30		0.80	*	-27		-22		-17		-6		-5	
q47	-17		0.63	*	14		4		-23		2		6	
q36	-1		0.62	*	22		9		-9		-3		-5	
q23	-3		0.53	*	17		3		2		6		-34	
q29	-16		0.52	*	-5		35		-6		-24		-11	
q40	-15		0.51	*	-16		-4		21		4		-8	
q35	5		26		23		8		21		5		-7	
q34	11		11		0.85	*	-12		-3		-19		-2	
q28	1		3		0.76	*	-32		0		-5		0	
q43	26		9		0.52	*	-5		1		27		-11	
q3	20		32		-0.42	*	4		4		19		-25	
q1	17		8		-16		0.77	*	11		-19		-11	
q19	21		0		-20		0.66	*	-8		38		9	
q31	42	*	15		2		0.50	*	-5		-8		45	*
q12	-19		6		-8		0.43	*	-27		19		6	
q22	29		11		18		-38		32		22		24	
q41	5		3		-10		-7		0.87	*	-8		-10	
q24	11		-14		6		2		0.60	*	-12		-16	
q11	-3		9		1		11		-20		0.77	*	2	
q44	-8		34		-2		2		19		0.50	*	-23	
q2	19		23		15		14		4		-0.54	*	5	
q46	37		-10		-11		-5		-4		-3		0.66	*
q39	10		13		1		-2		19		4		-38	
Printed values are multiplied by 100 and rounded to the nearest integer. Values greater than 0.4 are flagged by an '*'.														

Table 4.59 below reports on the six-scale reliability tests performed on the six subsets of rating values of questionnaire items extracted as factors in the PCFA. The first column indicates the label associated with each factor of nutrition knowledge. The second column in the table identifies the questionnaire items that describes the construct and the third column indicates instances where the responses of a specific question was reversed to be in line with the agreement-disagreement direction of the other questions in a subgroup. Scale reliability testing requires all questions in a subgroup to be either positively or negatively stated. For

example, if Knowledge of healthy food and lifestyle describes an aspect of food health and '*unlimited salt intake*' forms part of this subset of questions, the scale reliability analysis will indicate that the rating values for '*unlimited salt intake*' has to be reversed to express *'not unlimited salt intake*' to agree with other Knowledge of healthy food and lifestyle questions. The fourth column reports Cronbach alpha values (standardized) and the last column reports the overall perception score of all participants on an aspect of nutrition knowledge.

Table 4.59: Scale reliability testing results performed on the rating values of the six subsets of questionnaire items extracted as factors in factor analysis

Factor	Questionnaire items included	Items inverted	Standardised Cronbach alpha	Construct mean (Standard deviation)
Factor 1 Knowledge of healthy food and lifestyle **(N = 253)**	q4 q6 q14 q16 q21 q25 q26 q32 q38 q45 q48	q6	0.85	1.73 (0.61)
Factor 2 Informed of unhealthy food choices and lifestyle **(N = 266)**	q20 q23 q29 q36 q40 q45 q47'	-	0.74	3.65 (0.84)
Factor 3 Nutrition knowledge gap **(N=282)**	q3 q28 q34 q43	-	0.71	2.29 (1.01)
Factor 4 Distinctive healthful choices **(N = 270)**	q1 q19 q31 q12'		0.62	3.80 (0.88)
Factor 5 Limited general health knowledge **(N = 265)**	q24 q41	q12	0.57 (approx. 0.6)	2.55 (0.96)
Factor 6 Food custom deviation **(N = 268)**	q11 q44 q2	-	0.55 (approx. 0.6)	3.66 (0.99)
Construct mean scores are interpreted according to agreement scale rating values, namely '1' = 'strongly agree'; '2' = agree'; '3' = unsure, '4' = disagree, '5' = 'strongly disagree'				

Table 4.59 indicates that the first six factors all have Cronbach alpha values that approach the value of 0.6 which indicates, for exploratory research, to internal consistency reliability. According to Flake, Pek, and Hehman (2017), the process of construct validation begins with recognising a construct, defining it, developing a theory about the structure of the construct (e.g., how many factors are present, how they are related), selecting a means of measuring the construct (e.g., Likert-type scales), and establishing that the measure appropriately represents the construct. This process is the means by which evidence is generated to support

that scores reflect the target construct (i.e., have construct validity). These mean construct scores serve as first indication of how respondents perceived each aspect of nutrition knowledge in general.

The lowest score, namely 1.73 reported for perceptions on Knowledge of healthy food and lifestyle. This mean score is close to 2, which reflects 'agreement' or a positive perception of what constitutes healthy food and a healthy lifestyle. This can be interpreted as respondents being in general, knowledgeable about healthy food choices that may also include an understanding of the nutritional value of healthy food. This implies that on the Likert scale used, the majority of the respondents "agree" with the questions q4 q6 q14 q16 q21 q25 q26 q32 q38 q45 q48 regarding Factor 1 (Knowledge of healthy food and lifestyle). For instance, the majority of the respondents "agree" with the statement in question 4 that "It is important to drink a lot of water daily".

Contrary to agreeing with Factor 1, the construct mean for questions q20 q23 q29 q36 q40 q45 q47' regarding Factor 2 which is called "Informed of unhealthy food choices and lifestyle" is 3.65. This value is close to 4 on the Likert scale representing "disagree"; this implies that the majority of the respondents disagreed with the aforementioned questions which may indicate that the respondents were in fact much more informed about the healthier food choices and were able to make the distinction between what is better for them. For instance, the majority of the respondents "disagree" with the statement in question 20 that "I prefer to eat white bread even though brown bread is healthier".

The construct mean for questions q3 q28 q34 q43 regarding Factor 3 which refers to "Nutrition knowledge gap" is 2.29 which is within 3 on the Likert scale representing neutral. This implies that the respondents were indifferent in their responses to the three questions and were not exactly sure whether these facts could actually be true. For instance, the majority of the respondents were "neutral" regarding the statement in question 28 that "Dried beans can be used instead of meat". A statement such as this and the others related to Factor 3 call for a broader body of nutritional knowledge about the nutritional value of dried beans to enable the respondents to accredit dried beans as a substitute for meat.

The construct mean for questions q1 q19 q31 q12' regarding Factor 4 which refers to "Distinctive healthful choices" is 3.80. This value is close to 4 on the Likert scale representing "disagree"; this implies that the majority of the respondents disagreed with the aforementioned questions. For instance, the majority of the respondents "disagree" with the statement in statement 1 that states that "A healthy diet should include a lot of fatty foods". In this instance,

Factor 4 can be interpreted as respondents being able to very emphatically eliminate unhealthy food choices and have a better knowledge about healthier food choices.

The construct mean for questions q24 q41 regarding Factor 5 which refers to Limited general health knowledge is 2.55 which is close to 3 on the Likert scale representing "neutral". This implies that the respondents were indifferent in their responses to the above questions. For instance, the majority of the respondents were "neutral" with the statement in question 10 that referred to "It is unhealthy to be fat". In this instance, this factor indicates that general knowledge about the aspects that contribute to a healthy lifestyle may still be lacking causing an uncertainty when responding to such statements.

Questions q2 q11 q42 were included in Factor 6 which refers to Food custom deviation for which a higher mean construct score was reported, namely 3.66. This score approximates to the value of 4 which suggests that 'disagreement' or a negative perception of these habits were perceived resulting in customary practices being challenged with better informed choices.

In the next section the open ended questions which compiled Section B of the questionnaire are discussed.

4.4 OPEN ENDED QUESTIONS on Healthy Eating and Nutrition Related Opinions (Question 50-60)

In this section, 11 open ended questions were filled in by the same mothers who completed section A to give additional information on their perspective of nutritional knowledge, FBDG, eating practices and nutrition related opinions. The data was quantified in the sense that the concepts used by the respondents that emerged from a particular questions were identified. The frequency with which the concepts were used were calculated enabling the researcher to identify the most frequently used concepts or thinking related to a particular question. The responses to each of these questions are presented next in paragraphs 4.4.1 – 4.4.11 with diagrams indicating the identified concepts and the frequency with which the particular concepts were used by the respondents.

4.4.1 What is your understanding of "healthy eating?"

Figure 4.2 below reflects the findings on respondents' understanding of healthy eating:

What is your understanding of "healthy eating?"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Sausage and white bread	75	22.9	22.9	22.9
	Vegies and fruit and water	56	17.1	17.1	39.9
	Balanced diet	53	16.2	16.2	56.1
	Less sweets	53	16.2	16.2	72.3
	Methods of cooking	43	13.1	13.1	85.4
	Queen cakes and drinks	48	14.6	14.6	100.0
	Total	328	100.0	100.0	

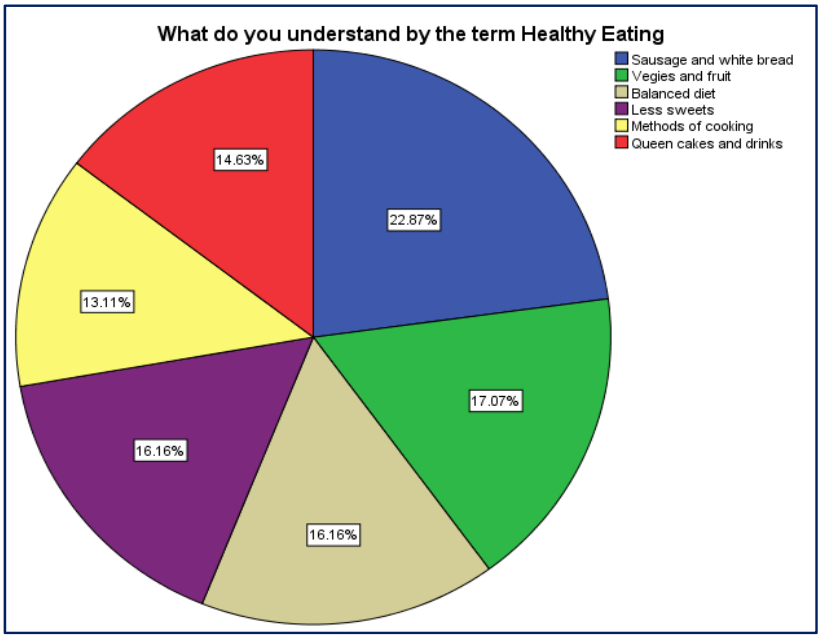

Figure 4.2: Frequency distribution of respondents' understanding of "healthy eating"

Data in Figure 4.2 from the written responses of the group administered questionnaires indicated that the majority (62%) have an understanding of what healthy eating means through various answers that were offered by the respondents. Some related to *what* they eat, including "less sweets" (16%), "more vegetables and fruit and drinking more water" (17%), and "having a balanced diet" (16%). For other respondents healthy eating referred to the methods of cooking, like, "baking and grilling" (13%). Verbatim quotes illustrate the way in which the respondents expressed their opinions about the term "healthy eating" in the following way: it is "*the consumption of plenty of vitamins and less sweets*"; *"Nice food and balanced diet which*

leads to strong body"; "*The food that I like such as vegetables, fruits and water*". "*To consume food which is properly cooked. Baked, grilled and steamed food with less fat also belongs to healthy eating*"

However, another group of respondents as reflected on the table, indicated that healthy eating does not necessarily related to anything stated in the previous quotes. These respondents referred to "*Any food that is nice to me, like white bread with sausage (23%), queen cakes and Stoney ginger cold drink*" (15%) as a more fitting description of what healthy eating means to them. Their understanding of healthy eating differs with Friel, Barosh and Lawrence (2013), who opine to limit intake of foods and drinks containing added sugars such as confectionery, sugar-sweetened soft drinks and cordials, as these foods are generally energy-dense and nutrient-poor and can readily contribute not only to excessive energy intake, but also nutritional imbalances.

This finding indicates that the majority (62%) of respondents seem to have understanding of healthy eating as they mentioned consumption of plenty vegetables and fruit and drinking more water, balanced diet for strong body, reduction of eating sweet foods, as well as using healthy cooking methods such as boiling, grilling and steaming food. Thus the World Health Organisation (WHO), (2014) supports the respondents as it defines a healthy eating as achieving energy balance, limiting energy intake from total fats, free sugars and salt and increasing consumption of fruits and vegetables, legumes, whole grains and nuts. This is also in line with Factor 1 "Knowledge of healthy food and lifestyle", hence the majority agreed with the positive statements.

Although the majority (62%) indicated that they have an understanding of what healthy eating means, the minority (38%) had different point of view in understanding of healthy eating. It can be maintained that those with a different point of view need to be cautioned on the dangers of energy-dense and nutrient-poor food

4.4.2 Which types of food do you consider as healthy?

Figure 4.3 below represents the data on types of food considered as healthy**:**

Which type of food do you consider as healthy?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fish, chicken, milk, pork and beef	102	31.1	31.1	31.1
	Porridge with milk, meat, eggs, fruit and vegetables	164	50.0	50.0	81.1
	Fish and chips	62	18.9	18.9	100.0
	Total	328	100.0	100.0	

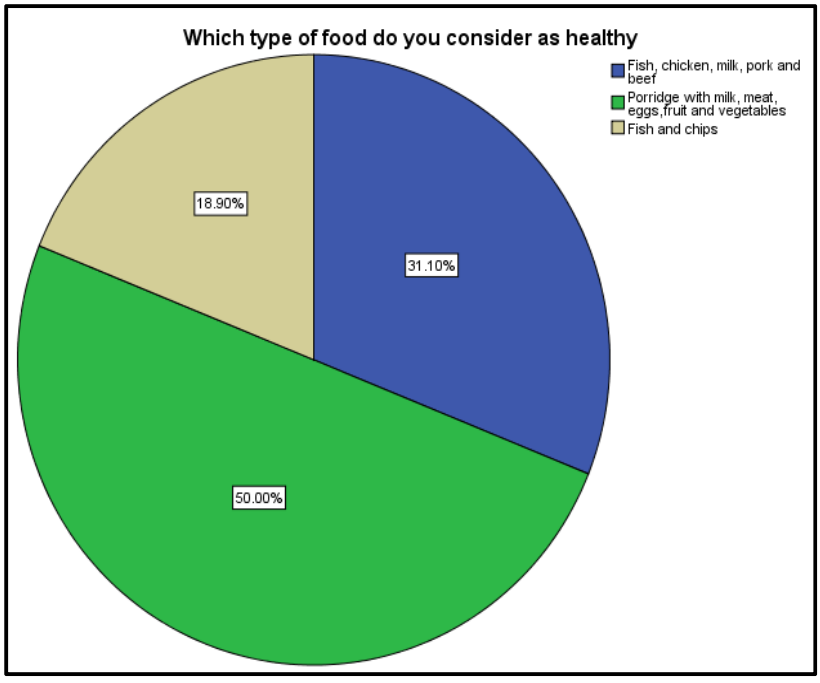

Figure 4.3: Frequency distribution of the types of food respondents considered as healthy

From the data, three main categories of ideas emerged of which half of the respondents (50%) considered porridge with milk and vegies as the most healthiest type of food to be consumed,

followed by respondents (31%) who thought fish, cheese, milk, chicken, pork and beef were also healthy food types with fewer respondents (19%) considering fish and chips as healthy food types. The majority (81%) of respondents therefore, regard foods such as meat, fruit and vegetables, porridge and milk as healthy food types. This finding is supported by the following verbatim statements: *"Healthy foods are fish, cheese, milk, chicken, pork and beef"; "Porridge with milk, eggs, meat, fruit and vegetables"; "I think meat, fruits and vegetables are very healthy food for human beings".*

Considering respondents' responses in this study they are in line with the food guide, in Figure 2.2 illustrating the food groups that should be eaten regularly. However the respondents in this study seem to are in line with Ares et al (2014) who recommends Fruits, Vegetables, Fish and seafood, Grains and cereals, and put emphasis on variety eating, across and within major food groups as there is no one food contains all the nutrients.

Furthermore, respondents' consideration of milk as healthy type of food is confirmed, as Paula and Pereira (2013) highlighted the most favourable claim in milk consumption. The authors claimed that, milk richness in calcium contributes to bone density and, its additional varied mineral components like peptides and conjugated linoleic acid (CLA), could play a positive role in bone mass, lowering prevalence of fractures and osteoporosis prevention.

Contrary to the positive responses, some respondents were of the opinion that fried foods were healthy foods as this respondent wrote *"Fried fish and chips are the best"* Absolutely, this group of respondents may require further information regarding food preparation methods as that could lead to an improvement of diet quality (Fabbri and Crosby, 2016).

It is insisted that the guidelines gap observed between the respondents needs to be addressed so as to achieve the healthy eating habits.

4.4.3: Why do you consider some foods as healthy?

Figure below depicts some of the food considered as healthy

Why do you consider some food as healthy?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Have body building nutrients and maintains weight	102	31.1	31.1	31.1
	All food is healthy	79	24.1	24.1	55.2
	Whatever is edible makes you fit and healthy	39	11.9	11.9	67.1
	Supply body with antioxidants and reduce HIV/AIDS	39	11.9	11.9	79.0
	Provide with energy	69	21.0	21.0	100.0
	Total	328	100.0	100.0	

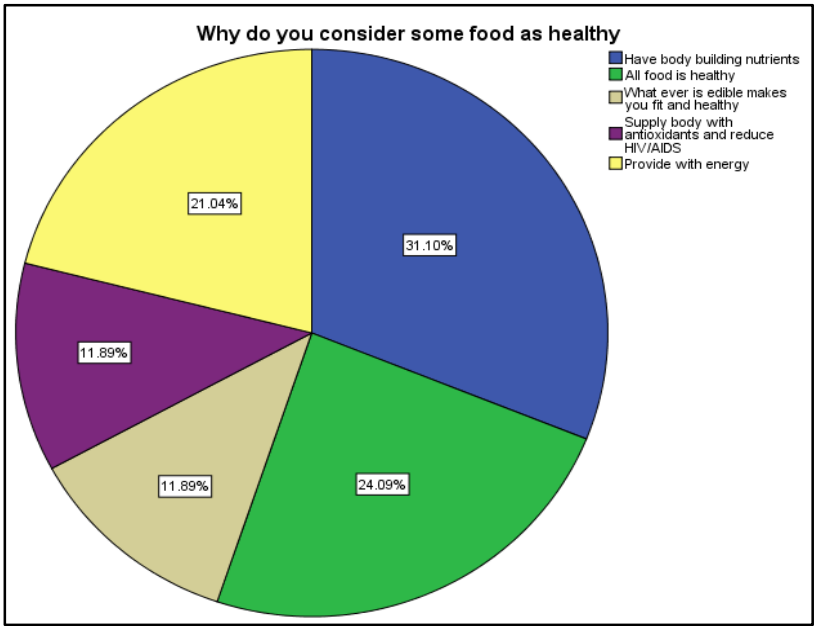

Figure 4.4: Frequency distribution on why do respondents consider some foods as healthy

The majority of respondents (64%) consider some food as healthy because they highlighted that "*these foods have body building nutrients and maintains weight (31%)*, *provide the body with energy (21%)*, *supply human bodies with antioxidants and reduce HIV and AIDS (12%)".*

They maintained that they considered such food as healthy as they contribute to overall healthy growth and development, energy levels; and lowers risk of diseases, as well as maintaining a healthy weight.

On the other hand, 24% respondents highlighted that they consider all food that is taken in as healthy. More so, 12% conveyed that whatever is edible makes a human being fit and healthy. Verbatim quotes illustrate the way in which the respondents expressed their opinions *"I do not know that there is food that is not healthy"; "If you eat whatever is edible, you become fit and healthy"* However, 35% of them were not aware of healthy food and its importance as revealed by others.

It can be argued that the term "whatever" needs to be explained by the respondent as it is not explicit in this context.

4.4.4. Which food choices are considered to be unhealthy?

Respondents felt that certain types of food are not good for their health and they have to limit their intake. The majority (97%) of respondents had a positive response concerning unhealthy food choices. For instance, red meat, fatty, salty and sweet food constitute such food. Their opinions are supported by McAfee, McSorley, Cuskelly, Moss, Wallance, Bonham, Fearon, (2009), who indicated that, red meat has been associated with increased risk of cardiovascular disease. In addition, (Ashakiran & Deepthi (2012) revealed that meals containing junk food do not fill up for long, because they lack fibre, and are made of processed foods, they are rated high on the glycaemic index, which means they provide a quick rise in blood sugar, but this also falls quickly, and giving rise to hunger. Mothers' opinions are demonstrated by the comments in the following figure:

Which foods choices are considered to be unhealthy?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Don't know that there is un heathy food	3	.9	.9	.9
	Junk food and alcohol not good for health	141	43.0	43.0	43.9
	Starchy food and junk	56	17.1	17.1	61.0
	Cut down red meat	128	39.0	39.0	100.0
	Total	328	100.0	100.0	

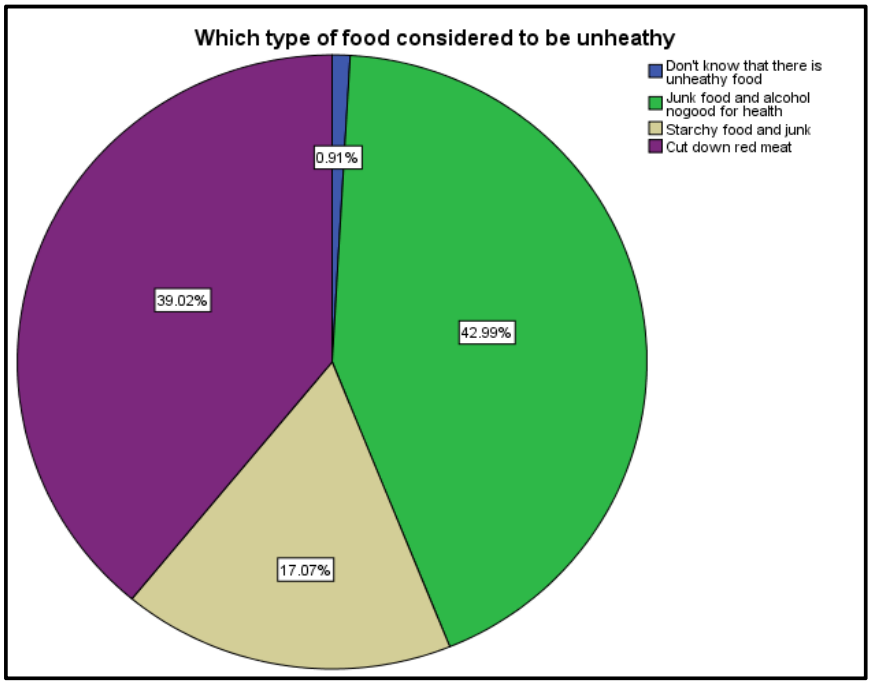

Figure 4.5 Frequency distribution of which food choices considered to be unhealthy

"We have to cut down on red meat, or else…….(6 feet underground)"; "Fatty *foods like fat koek, junk foods like crispy chips, sweets and alcohol are not good for health"*; *"Starchy food, salt and sugar, fast foods, burgers, cheap foods, junk foods, sweets and fats are always are available"*. However, 3% of the respondents reflected that they think all food items are healthy, especially those always available.

4.4.5: Why some food choices are considered to be unhealthy?

Although there were mixed feelings/perceptions about this question, approximately 69% of the respondents expressed their views that, there is a relationship between food/diet and health. They mentioned that lack of vegetables and fruit could be the cause of sickness to human beings. They associate unhealthy food with poor eating habits. Respondents in this study voiced out that *"Sweet and stale food cause human bodies to be fat and sick"; "Unhealthy food choices include too much fat, salt and sugar"; "No, what you think is unhealthy food for you might be the healthy one for me".* However, Alkerwi (2014) stated that, the latter statement reveals that for a diet to be healthy depends to the state of health an individual. It can be argued that, a healthy diet could be modified to special individual needs to reach optimal health.

Why some food choices are considered to be unhealthy?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A healthy diet depends on the state of health of an individual	112	34.1	34.1	34.1
	Sweet and stale food cause sickness in humans	62	18.9	18.9	53.0
	Unhealthy food contains too much fat and sugar	46	14.0	14.0	67.1
	What you think is unhealthy to you may be healthy for me	108	32.9	32.9	100.0
	Total	328	100.0	100.0	

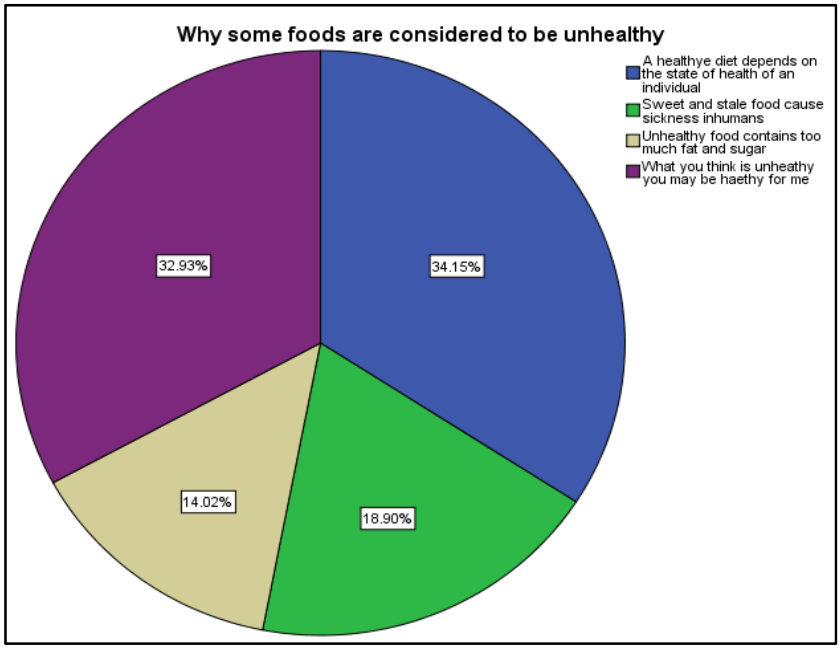

Figure 4.6: frequency distribution of why some food choices are considered to be unhealthy

4.4.6: Do you have Knowledge about SA Food Based Dietary Guidelines?

The data captured reflects that half of the respondents in this study were not aware of the existence of the South African Food-Based Dietary Guidelines. Some of the respondents thought of the four food groups, and others claimed to be in search of the official instructions by the SAFBDG.

The following figure reflects the direct of the participants.

Do you have knowledge of SA FBDG?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Four food groups	102	31.1	31.1	31.1
	Still in search for the official instructions by SA FBDG	102	31.1	31.1	62.2
	I do not know what FBDG are	124	37.8	37.8	100.0
	Total	328	100.0	100.0	

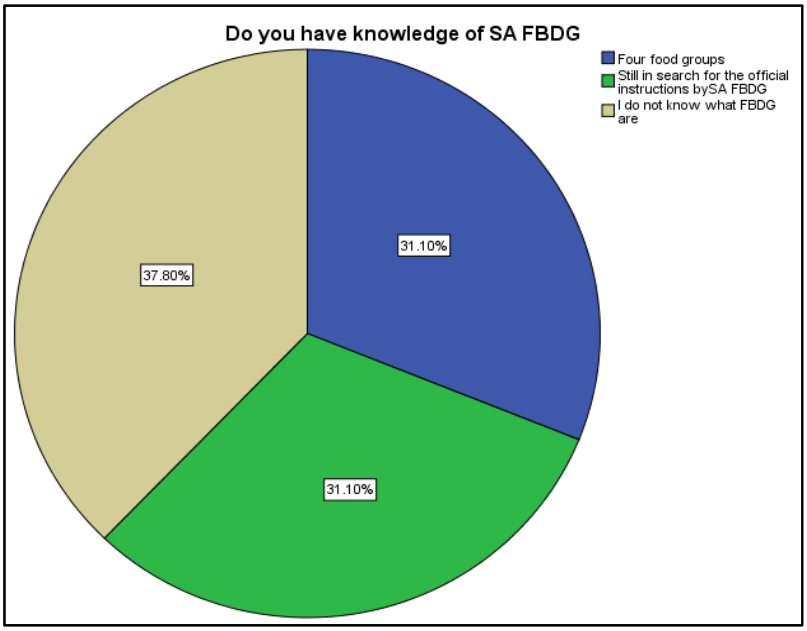

Figure 4.7: Frequency distribution of respondents' knowledge about SA Food Based Dietary Guidelines

"I do not know, what are food based dietary guidelines? Is it the food triangle?"; "Oh, you mean four food groups"; "I have to be in search of the official instructions by the SAFBDG", They are associated with high income group, I suppose". Seemingly, they confused SAFBDG with Food Groups and/or Food Guide Pyramid. The responses to question point at the fact that the community where this study carried out requires more concrete knowledge with regard to the contents of the publications of the SAFBDG and its operational procedures. All consumer scientists,nutritionists, dietitians, etc., should take responsibility for applying the SA FBDGsin nutrition education to various groups. However, the DoH should be responsible for making allmedical and applied sciences aware of this tool and monitor its application.

4.4.7: What poor nutritional practices practised by your child?

Approximately 81% of the respondents reported that they consider certain nutritional practices performed by their children as poor. Mothers reported that in addition to energy dense food, their children prefer fried food like fat koekies (amagwinya), sausage and fried eggs. This could have negative effects as Gadiraju, Patel, Gaziano and Djoussé (2015) highlighted that frequent consumption of fried foods is associated with a higher risk of hypertension and gestational diabetes. An informant explained this as follows:

What poor nutritional practices practiced by your child?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	They like white bread	42	12.8	12.8	12.8
	Consumption of junk	79	24.1	24.1	36.9
	Fried sausage, eggs make the best breakfast	129	39.3	39.3	76.2
	They are not stable, eat what is available	78	23.8	23.8	100.0
	Total	328	100.0	100.0	

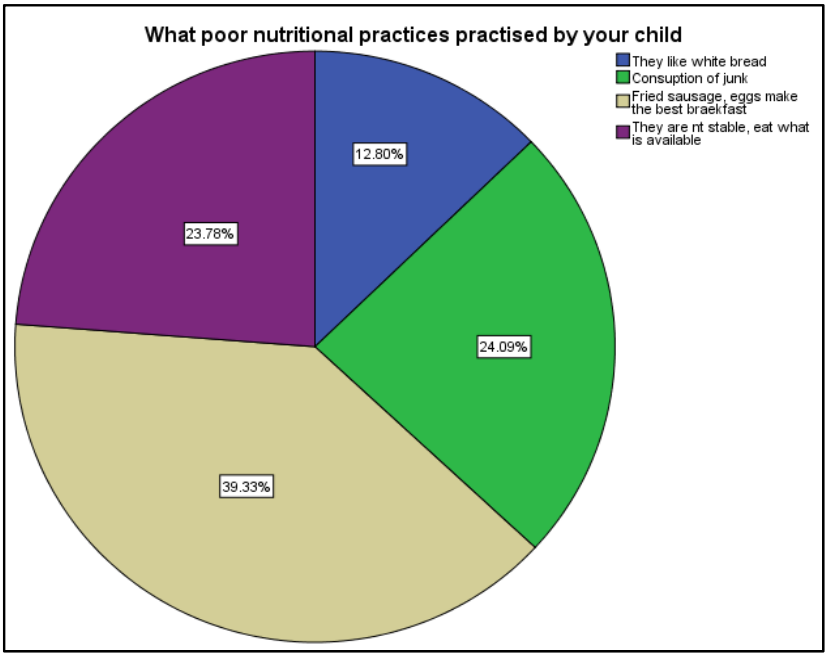

Figure 4.8: Frequency distribution of what poor nutritional practices practised by respondents' child

"When children eat sweets, cakes, Simba chips have poor nutritional practices. Even the fat cookies they buy from Mambhele and eat is full of fat"; "Fried sausage and fried eggs make

the best breakfast of their choice"; "We all like white bread and tea, is that poor?" About 17%of the respondents do not know poor nutritional practices of their children. This finding is portrayed in the following statement: "*I do not know, they are not stable. They eat what is available.* The finding points out that, although some of the respondents'' seem not to understand poor nutritional practices of their children, the majority is aware that energy dense and fatty food consumption are poor nutritional practices.

4.4.8: What good nutritional practices are practised by your child?

The majority (83%) respondents expressed that knowing what to do is not the problem, rather actually doing those things is the problem. The following statements reflect the findings:

What good nutritional practices are practiced by your child?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	They wash hands before they eat	108	32.9	32.9	32.9
	If she has appetite she eats all food for the day	46	14.0	14.0	47.0
	I do not know because I am not always with them	75	22.9	22.9	69.8
	They like raw carrot African salad and fruits	99	30.2	30.2	100.0
	Total	328	100.0	100.0	

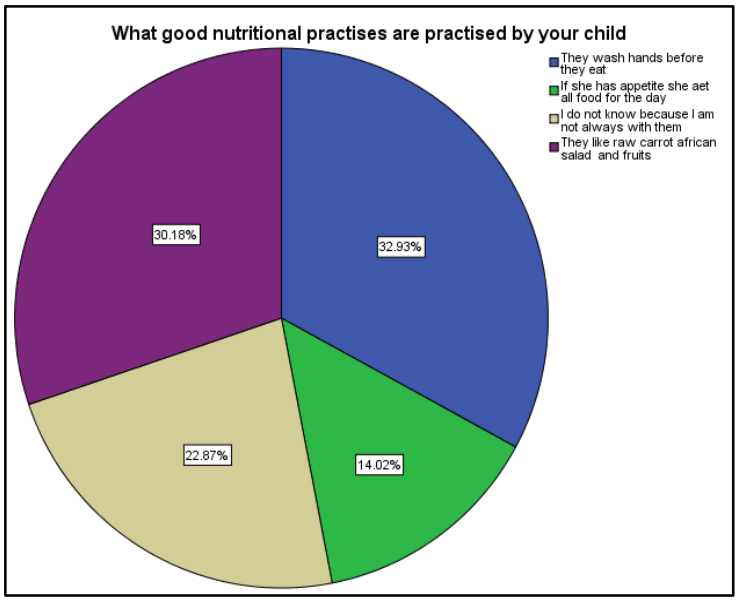

Figure 4.9: Frequency distribution of good nutritional practices are practised by respondents' child

"Koko like to eat raw carrot, mvubo (pap and sour milk) and fruit" "I am happy about that because I know that it is a good thing to eat fruit, vegetables and umvubo"; "I tell them to wash hands before they eat, sometimes they do"; "If she has appetite, she eats all food for the day". The minority (14%) of respondents stated that the do not know good nutritional practices by their children. One of them cited "*I do not know because I am not always with them".*

4.4.9: What constraints do you encounter when applying good nutritional practices?

About 39% of respondents stated that they had never identified any constraints when applying good nutritional practices. However, the following statement depict the finding: *"I do not know that really, I am not in their heart"*

What constraints do you encountered when you apply good nutritional practices

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I do not know	98	29.9	29.9	29.9
	Do not like vegetables when available	148	45.1	45.1	75.0
	Like bread and tea more than a full meal	82	25.0	25.0	100.0
	Total	328	100.0	100.0	

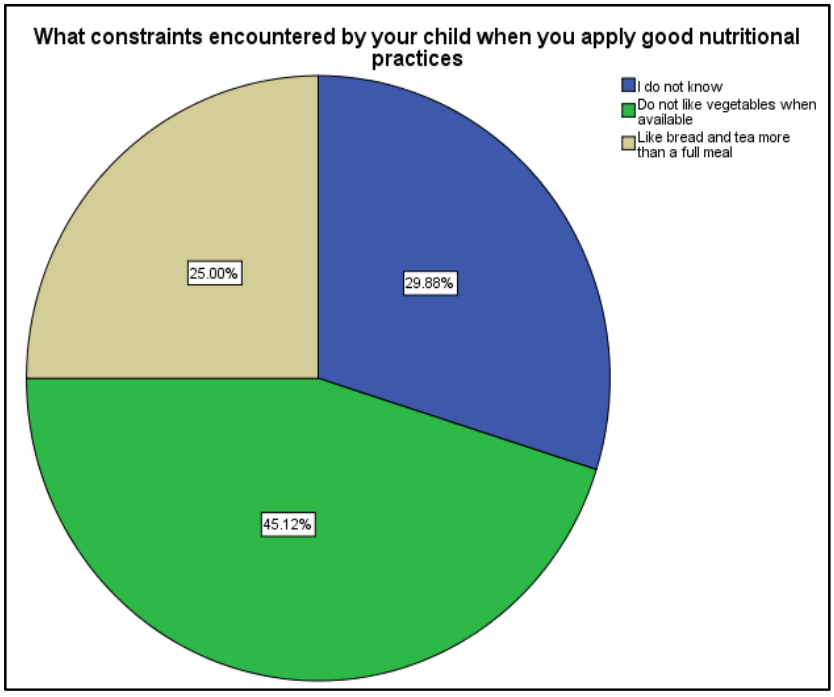

Figure 4.10: Frequency distribution of constraints encountered by respondents when applying good nutritional practices

Other respondents portrayed the following excerpts: *"Eish! He does not like vegetables when available, he become sick when he see colourful plate"; "Mine choose to eat rice with gravy, potatoes and meat. She leaves the rest for the dogs"; "My children like to eat bread and tea more than a full meal, they do not like fruit and vegetables"; "Lack of funds to buy the right type of food when they have appetite".*

It can be maintained that good nutritional practices include eating of fruits and vegetables where many dieticians recommend these foods due to the following reasons: The Dietary Guidelines for Americans and the SAFBDG encourage consumption of a variety of fruits and vegetables daily. The current recommendation is at least 2 servings of fruits and 2 servings of vegetables per day. Fruits and vegetables provide essential vitamins and minerals, fibre, and other substances that may protect against many chronic diseases for children. Vegetables are known to be high in fibre. Furthermore, fruits and vegetables help children feel fuller longer. They provide children with the opportunity to learn about different textures, colours, and tastes. They help children potentially develop life-long healthy eating habits. These are some of the most common advantages of the consumption of fruits and vegetables.

4.4.10: What poor nutritional practices do you apply?

31% of respondents revealed that they eat what is available. Mothers explained as follows:

What poor nutritional practices do you apply?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I give them sweets to distract them while still cooking	32	9.8	9.8	9.8
	Lack of funds to buy healthy food	194	59.1	59.1	68.9
	Eat what is available	102	31.1	31.1	100.0
	Total	328	100.0	100.0	

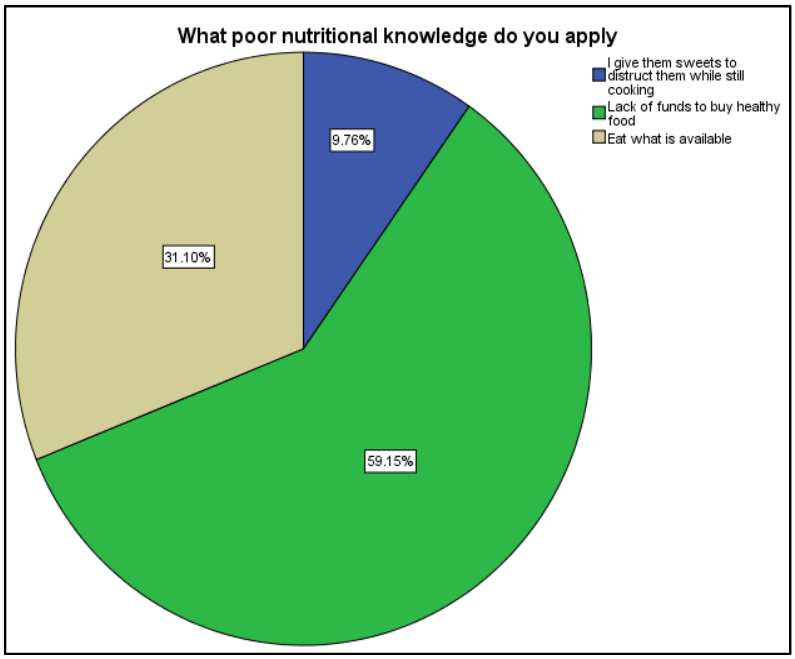

Figure 4.11: Frequency distribution of constraints respondents' poor nutritional practices

"I understand that you want us to eat healthy but money talks. I eat and give my children what is available in the cupboard for example, if I have mealie-meal and sugar, all is well. I cook stiff pap and tea and that will be the meal for the day. It also depends on the availability of electricity or gas".

Others disclosed the following excerpts *"I never eat balanced diet at home unless I attended some occasion. I do not have funds to buy the right type of food, its expensive especially kwaSinethemba (the local shop). Other shops are too far"; "If the child is hungry while I am still cooking, I simply give sweets to while away time. I like sweets".*

Other poor nutritional practices mentioned by the respondents included; failing to know the good nutritional practices and the uncontrollable love for eating sweets. This issue relates with the previous topic where the question asked about the applications of good nutritional practices and the obstacles face. The other approach would be the practice of the opposite of the application of good nutritional practices amounts to practising poor nutritional practices. In essence, this implies; failure to encourage the consumption of a variety of fruits and vegetables on daily basis, failure to encourage children to learn about different textures, colours, and tastes of fruits and vegetables. These additional reasons can be stated as; living too far from shops and lack of appetite as claimed by children most of the time.

4.4.11: Which good nutritional practices do you apply?

According to question 4.3.11, the majority of mothers reported that they apply good nutritional practices, and few of them revealed no signs of applying good nutritional practices. The following responses reflect this finding:

Which good nutritional practices do you apply

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Do not know good nutritional practices	30	9.1	9.1	9.1
	Eat well balanced diet whenever I have funds and exercise three times a week	105	32.0	32.0	41.2
	Eat vegetables, fruit and drink enough water	193	58.8	58.8	100.0
	Total	328	100.0	100.0	

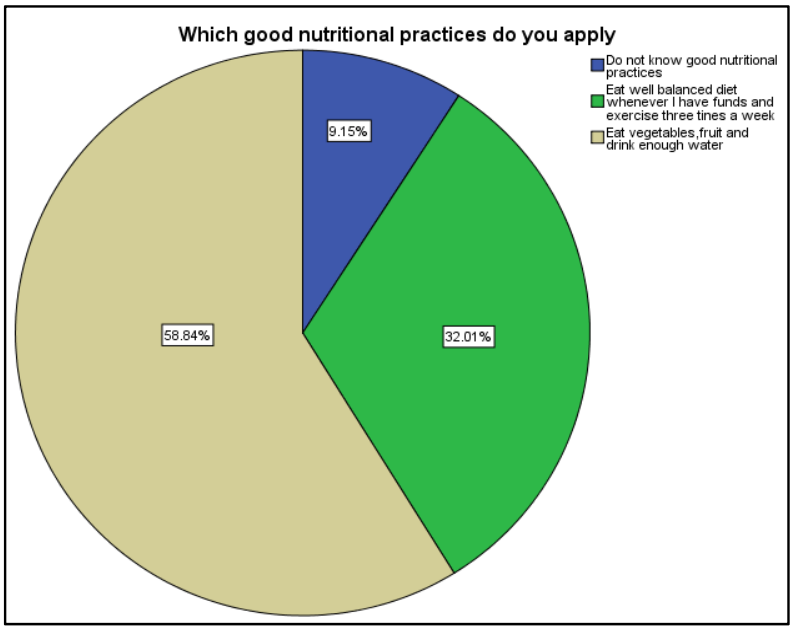

Figure 4.12: Frequency distribution of constraints respondents' good nutritional practices

"I eat lot of vegetables, fruits and drink enough water". "As far as I am concerned, I eat well-balanced diets whenever I can and I do physical exercise three times a week". It was observed, however, that although the majority practice the proper good applications, a few questions are in order at this point in the research time. This group of participants may be confused by failure to know the proper nutritional practices when it comes to food policies. This send a signal of the need for more practical education on good nutritional practices in the target communities.

The clear issue to be addressed is that those who practice good nutritional applications do not exhaust the recommended list of practices by the SAFBDG. Failure to apply good nutritional practices meant that a child could easily develop one or all of the following problems; stunting, underweight, wasting, and morbidity. These are very serious problems to be faced by any child.

4.5 CONCLUSION

This chapter provides an analysis and interpretation of the results of this study pertaining to the nutritional knowledge of mothers in relation to eating habits of their own and of their children. The demographic profile is provided to give background information of the respondents. The demographic profile of the respondents was analysed using the statistical programme SPSS Version 26.0. The Principal Component Factor Analysis (PCFA) was implemented to extract six factors deemed the best fit for the 49 closed questions. The six factors extracted by the factor analyses were aspects which the subsets of questions address or linked with and were described as ideas or perceptions of the respondents. Extracted factors have Cronbach alpha values that approach the value of 0.6 which indicates, for exploratory research, to internal consistency reliability. Cronbach's alpha was used as an indicator of instrument or scale reliability or internal consistency.

The chapter then proceeded to present the results of the responses to the open-ended questions from the nutrition related opinions. The findings from this Section correlate with the factors as the majority of the respondents understand the benefit of healthy eating and lifestyle. They believe that healthy eating keeps them healthy; it provides them with nutrients, gives them energy, helps them feel better and prevents disease. However, mothers revealed that they do not have access to healthy food due to availability and affordability.

CHAPTER 5

CONCLUSION

5.1 INTRODUCTION

In the previous chapter, the results of the data were presented and interpreted. In this chapter, the main findings are presented in order to establish the contribution the data have made to better understand the objectives of the study. Recommendations for further research are made and the limitations within the study are identified. The contribution of the study is also presented.

5.2 SUMMARY OF THE MAIN FINDINGS OF THE STUDY

5.2.1 The demographic summary of the respondents

As much as demographic characteristics were not part of objectives of this study, they indirectly affect its outcomes.The majority (49.34%) of respondents were between 31 and 49 years of age with almost half who had acquired high school education or college/university education. It is assumed that with this level of education participants would be likely to observe healthy eating habits taking into account some basic nutrition education taking place within the school curriculum. The majority (45%) of respondents with high school level of education, with additional 28% of the respondents who acquired more than a high school education seemed to be the relevant group to answer the purpose of the study. Their level of education might strengthen the level of nutrition knowledge thereof. However, it was indicated in 4.2.1.1 that, there is a smaller number of respondents who were better educated and some were even university dropouts, which could be of benefit for the purpose of the study. The level of education contributed to innovative skills, beliefs and choices about sound health and nutritional practices. It can be concluded, from the descriptive statistics, that the majority (73%) of respondents are a good sample to give data on healthy eating and nutrition related opinions explored in this study. However, although the majority were educated, the 2015 Vulnerable Groups Indicator (Statistics South Africa, 2015:69) show that only 21% of African women at the national average had matric in South Africa.

The largest proportion of the respondents in this study earns less than R1000 – R4999 per month. This raised, a concern whether the current income of the majority (81.31%) can in fact support a healthy food intake as Patrick and Nicklas (2005:89) highlighted that income is an important predictor of eating patterns. However, Amos, Intiful, and Boateng (2012) also pointed out that higher income groups are considered to be eating more of the foods classified as part of a healthy diet and consuming more fruit and vegetables, which may not be the case for lower

income groups. This is in line with Darmon, Ferguson and Briend (2006) idea that says nutritionally adequate diets can be promoted to middle and upper-income women, but may be difficult to be adopted by those on a low food budget. The majority of mothers were not married, most of them being housewives It is evident that Income could significantly influence household purchasing and household food access. In view of the above, the respondents might not be able to apply their knowledge due to lack of financial resources, as affordability determines the availability of healthy food items.

5.3 Summary of the main findings of the study

Each objective will be discussed in terms of the main findings that shed light on mother's basic nutrition knowledge, their perception on FBDG and their influence on eating habits of children. This presents a challenge in designing a nutrition education programme that is practical in promoting healthy food choices, FBDG and healthy eating habits. In order to determine mother's basic nutritional knowledge in this study, Principal Confirmatory Factor Analysis (PCFA) was implemented to extract six factors deemed the best fit for the 49 closed questions encompassing Food Based Dietary Guidelines. The six factors extracted by the factor analyses are aspects which the subsets of questions address or linked with and were described as ideas or perceptions related to: Knowledge of healthy food and lifestyle; Informed of unhealthy food choices and lifestyle; Nutrition knowledge gap; Distinctive healthful choices; Limited general health knowledge and Food custom deviation. Additional open-ended questions relate with the factors as the majority of the respondents understand the benefit of healthy eating and lifestyle.

5.3.1 Objective 1: To determine mothers' basic nutritional knowledge with reference to the FBDG

Nutritional knowledge of mothers is required to improve children's feeding patterns so that adequate nutrition for the children is reached, and in this way they can grow and develop well (Sukandara, Khomsan, Anwar, Riyadi, Mudjajanto, 2015). When the FBDG were applied to determine the respondents' nutrition knowledge, the general response was that they did not necessarily used the guidelines when planning meals, but they had an idea of what and how to prepare meals for their families/children. It was revealed by the frequency of positive responses on various questions. For example, the respondents expressed their opinions on *"consumption of plenty of vitamins, less sweets* and *balanced diet could lead to strong body"*; consumption of *baked, grilled and steamed vegetables with less fat, more fruits and water*". The participants also indicated that available resources such as money to buy, electricity/ fuel to cook and time determines what they prepare .The respondents mentioned earlier on (4.2.1.3) that they have to take care of children and household chores no husband to assist., since the majority is not married. .It was indicated in the findings (statement 30) that 43% of

respondents chose fish, as fish is a cheap alternative of meat. Pilchards (sardine) is readily available and relatively inexpensive in SA local shops. Isaacs Agric & Food Secure (2016) maintained that pilchard is an oily fish, which is very rich in omega-3 fatty acids, which lower triglycerides and cholesterol levels. If they don't have enough money they will be able to use the guidelines to guide them in choosing the right food with a limited budget. The implication of this fact is that the respondents were not of the opinion that the FBDG applied to them with lower monthly income but were rather more suited to higher income groups.as indicated in statement (4.3.6). Surprisingly, when the respondents' knowledge were tested on the FBDG and other nutrition related questions, the majority of respondents were in general, knowledgeable about healthy food choices that may also suggest a possible understanding of the nutritional value of healthy food.

The respondents reflected positive responses in questions pertaining to: health and physical activity; apple snack instead of sweets; meat, fish, chicken and milk as good sources of protein; brown bread health benefits ; eating eggs as good as eating meat; suitable methods of vegetable preparation; importance of taking required amount of water daily and Soy beans protein richness. These statements were regarded as Factor 1 which present Knowledge of healthy food and lifestyle. The responses of the respondents in this study revealed that they feel it is important to be physically active because it helps the body.Cerdá et al., (2016) supports the positive responses as they maintained that physical activity has many health benefits such as protecting against the development of chronic diseases and improving quality of life. Scott (2006) further concur with the authors that physical activity is important because it is interlinked with mental development. Therefore, to be physically active is beneficial to the body as there is growing evidence indicating that exercise can be effective in improving the mental well-being of the public, mostly through an improved mood and self-perception.

It is recommended to take an apple snack instead of sweets. Personal preference, the availability and affordability of the foods could influence the outcome of eating vegetables and fruits every day guideline.

Fish, chicken, lean meat or eggs could be eaten daily as one of the recommended guidelines was amongst the statements of the questionnaire that were agreed on by the respondents. As much as animal source food (ASF), constitutes high-quantity and high-quality protein, and contain essential amino acids (Schonfeldt, Pretorius, and Hall, 2013), it only have to be taken in in moderation. Popkin and Shufa Du (2003) emphasized that foods of animal origin/ASF, and diets relatively high in fat and saturated fat could increase the risk of chronic diseases.

Additionally, within the general consumer price index (CPI) meat contributes a third of a food basket. This contribution could be reduced without negatively impacting on protein quality by increasing the consumption of legumes, minimally processed grains, legumes, fiber, vegetables, fruits and foods of plant origin a much more affordable protein source that protect against chronic diseases. People could rather opt for cheaper option source of protein (Pilchards) instead of expensive meat

Furthermore, the study results showed that the nutritional value of the FBDG “Eat dry beans, split peas, lentils and soya regularly” were not well understood. The respondents were indifferent in their responses to this guideline and were not exactly sure whether substituting meat with legumes could actually be a good option. However, beans are low in fat, a good source of complex carbohydrates, fibre and other nutrients such as B vitamins, especially folate, the minerals iron, zinc calcium and magnesium A further advantage of including more plant based proteins in the diet is the absence of cholesterol which is a stark difference to the moderate to high levels of this sterol found in animal protein sources (Busch, 2017). In addition to these positive factors, meat production methods require a significantly greater amount of environmental resources compared to cultivating plant based protein sources subsequently contributing to lowering the effect of carbon admissions and eventually positively impacting on climate change (Joshi and Kumar, 2015). Nutrition intervention approaches (Socioeconomic Strategies, Nutrition Education and Protein Energy Malnutrition (PEM) purposefully chosen for the specific community could assist in aiding the respondents to choose nutritious, locally available and affordable food instead of more expensive and possibly less nutritious food.

The respondents had a good understanding of the term healthy eating.. They indicated that the consumption of a variety of vegetables and fruits, including water as a preferred choice of fluid in the diet were healthy options whilst reducing the intake of refined and sweet foods were a prudent option. In addition they preferred using healthy cooking methods such as boiling, grilling and steaming. These findings are in line with the World Health Organisation (WHO), (2014) recommendations on healthy eating practices.. It is also encouraging that the respondents seem to show a basic understanding of the different food groups. This could possibly be due to exposure to some nutrition education during their schooling years. It would be good if this nutrition knowledge could be culturally transformed and then ultimately handed down from generation to generation.

Additionally, the respondents understood the meaning of unhealthy food choices and lifestyle (Factor 2). This became apparent when they agreed with questions on unhealthy practices (q20 q23 q29 q36 q40 q45 q47). This may indicate that the respondents were in fact much

more informed about healthier food choices and therefore they were able to make a distinction between healthy and unhealthy food choices. The majority (71, 5%) gave positive responses on good nutritional practices required for healthy growth and development of children. The respondents did not align themselves with just filling up the stomach, but understood what to buy, prepare and cook for their children and family members. This view is in line with, Marshall's (1995: 111) findings suggesting the importance of mothers knowing what foods to buy, where to buy and how to prepare and cook it.

Supporting these findings, Factor 4, (distinctive healthful choices) depicted that respondents were able to emphatically eliminate unhealthy food choices and had a better knowledge about healthier food choices than was anticipated. More so, finding on Factor 6, on food custom deviation suggest that 'disagreement' or a negative perception of customary habits resulted in customary practices being challenged and replaced by better informed food choices. The customary practice of adding bicarbonate of soda during the preparation of vegetables were challenged, possibly because the respondents were informed consumers. Although the respondents might not have had detailed information on specific nutrients such as vitamin C, vitamin D, Riboflavin and Thiamine that are destroyed in this process, they realised that it could be detrimental to foods nutrient contents (Rio,2013). It was encouraging that 70% of respondent realised that maize porridge as the main food item of family meals were . However, the positive responses in this study would not necessarily mean that their nutritional knowledge is generally applied and implemented. Ntuli (2005) found a widespread lack of correlation between nutrition knowledge and the application of that information. In addition, Faulds (2007: 15) clearly stated that dietary imbalance due to lack of knowledge is a major contributory factor to mild and moderate malnutrition. Looking at the large number of positive responses from this study group and the current state of malnutrition in SA is surprising. It can be argued that the nutrition intervention approaches (Socioeconomic Strategies, Nutrition Education and Protein Energy Malnutrition (PEM) should be in place targeting women and children, with a specific focus on pregnant women.

On the other hand, some of the respondents in this study portrayed nutritional knowledge gaps (Factor 3) as they were not exactly sure whether the given facts on knowledge about healthier food choices were actually true or false. The majority of the respondents in this study were not aware that being fat was unhealthy. This could to some extend be explained in the culturally believe that fat women are more attractive and fitness often linked to a person's HIV/Aids status.. This assertion is supported by Goedecke et al. (2006:72) when they state that in African culture, an overweight body has positive connotations because it symbolises beauty, happiness, affluence, health and a negative HIV/AIDS status.

Also the emergence of Factor 5 which refers to limited general health knowledge, statements 24 (drinking lot of beer is harmful to your body) and 41 (it is unhealthy to eat lots of fat). The respondents responded positively in both statements. However, it is a concern to get close to 40% of respondents who agreed to such statements.as this might be influenced by different factors. Supporting the statement of alcoholic drinks could be harmful to the human beings. De Gaetano, Costanzo, Castelnuovo, Badimon, Bejko, Alkerwi, Chiva-Blanch, Estruch, Vecchia, Panico, Pounis, Sofi; Stranges, Trevisan, Ursini, Cerletti, Donati, Iacoviello (2016) stated that the harms associated with excessive intake of beer include increased disease risk involving many organs and associated social problems such as addiction, accidents, violence and crime.

5.3.2 Objective 2: To determine mothers perception of Food Based Dietary Guidelines

FBDG were developed to simultaneously ensure the adoption of adequate diets that meet all nutrient needs, and diets that help to prevent the development of deficiencies and NCDs (Vorster et al, 2013). However, in this study the majority of respondents revealed that they do not have any knowledge of the existence of the South African Food-Based Dietary Guidelines (SA FBDG). If this is in fact the case it is questionable how such respondents would in fact be able to achieve the aims the guidelines set out. Contrary to the above where most of the respondents gave knowledgeable responses to nutrition related questions they claim not to know the FBDG and in particular they are unaware that the knowledge they have is in fact related to the SA FBDG. However, FAO argued that, since consumers think in terms of food rather than of nutrients, the concept of disseminating information through FBDG is inherently sensible.

5.3.3 Objective 3: To determine the possible influence mothers may have on children's eating habits

Human food choices are based on many factors that influence the individual decision (Janeiro, 2012). According to Shepherd (1999), food choice is not a simple process because it is influenced by many interrelating factors, categorised as those related to the food, to the person making the food choice as well as external economic and social environment within which the choice is made. With regard to food choice, mothers were restricted by financial resources to achieve healthy eating. Considering this except *"I never eat balanced diet at home unless I attended some occasion. I do not have funds to buy the right type of food, its expensive especially kwaSinethemba (the local shop). Other shops are too far",* it is the amount of money that the family has for food expenditure that determines the quantity and variety of foods that the family can consume in its diet (Agiobu-kemmer, Aina, Zei tlin, Setiloane, 2000). Agiobu-

kemmer et al., 2000) further alluded that, family food income, as an index of socio-economic status, is a measure of the family's food purchasing power.

Foods such as vegetables and fruits are significantly more expensive than foods that are high in carbohydrates, fats and sugar. However, these foods (carbohydrates) do not contain enough nutrients, but since they are more affordable, some mothers choose to buy them anyway as this provides sufficient quantity of food and prevents hunger. High energy foods such as maize meal, white rice and bread also keep the individuals full for a longer time than after eating vegetables and fruits. Because of these factors, it is hard for lower income families to find the economical possibility or motivation to buy healthier foods since they cannot afford it as the concern is that their children will become hungry if they are switched from consuming high energy foods to vegetables and fruits (Agiobu-kemmer et al., 2000)

Antoniou et al., (2016) are of the opinion that, children's food choices are among others influenced by environmental cues and their parents' behaviour. For instance, some respondent stated that, if the child is hungry, she simply give the child sweets to while away the time because she (mother) likes sweets. However, Blissett et al., (2015) highlighted that, observing familiar others, especially parents, consume different foods and model their intake leads to the social facilitation of eating behaviour. Thus, in households in which fruits and vegetables are consumed by parents, they are more readily available and accessible, leading to a child's greater exposure to fruits and vegetables. This study revealed that, mothers play an important role in children's eating environment and food preferences by means of their own eating behaviours, attitudes and child-feeding practices. It has been suggested that parental control over child eating may be a prominent environmental influence on children's eating.

The decision of giving a family anything that is palatable to fill up their stomach could become a norm as eating habits are part of culture that is learned. It can be argued that the respondent who practised this learned it because, knowledge with regard to food is gained through a process of socialisation by means of modelling the transmission of beliefs, norms and values. This is supported by Hunt, Fazio, Mackenzie & Moloney (2011); Mattsson &Helmerson (2007) when stated that through primary socialisation in the family children learn and get to know the types of food readily available in the environment and which ones are edible and acceptable in their culture. It is for this reason that food has social and cultural functions not only a search for nutrients (Antoniou et al., 2015). The contribution of the study is discussed below.

5.4 CONTRIBUTION OF THE STUDY

With this study it is suggested that a better awareness of FBDG could be reached and used as a foundation for planning, implementing and evaluation of public health nutrition strategies. By so doing acceptable recommendation for a healthy diet will be achieved. It is suggested that through the findings of this study the gaps in mothers approach to nutritious meal preparation can be identified and address through nutrition educational programs. It is also envisaged that the findings of this study may be helpful to improve food schemes implemented at school level whereby the importance of well balanced meals could be implemented. Also it will contribute to the researchers of this discipline to be competent Consumer Scientists, thus will enhance professional development.

5.5 LIMITATIONS AND DELIMITATIONS OF THE STUDY

The study only concentrated on mothers in a certain geographical area (Mthatha) and does not represent the larger population of South African mothers. Additionally, South Africa is a rainbow nation consisting of various ethnic groups, but due to the demographics of Mthatha only Black women participated in this study. The fact that the study is of an exploratory nature Implies that the findings can't be generalised to the broader South African context.

5.6 RECOMMENDATIONS

Since the respondent raised that they know what they are supposed to eat but they lack funds, it is recommended that small vegetable garden project be introduced. This will enable a household to produce the vegetables needed to support food security for low income households.

Policies and interventions to address inadequate early nutrition as well as high-energy, unbalanced nutrition should be developed to address malnutrition, particularly targeting women, as the knowledge given to women may be a powerful weapon against malnutrition.

Although the majority of mothers seem to have knowledge of nutritious and healthy food, more still need to be done to increase their knowledge base specifically in which areas in the value of the Food Based Dietary Guidelines of South Africa and its practical implementation in daily life situation.

Nutrition education from primary school is strongly recommended, and is it recommended that the Department of Education should consider introducing such curriculum at Early Childhood Development Centres prior to primary school.

Improving nutrition knowledge through education and interventions may help prevent chronic disease and improve the quality of life, which points to the responsibility of the government to ensure that appropriate educational interventions occur.

FBDG implementation program to bridge the gap between nutrition and what should be done on a nutritional level, is recommended.

The responses reflected that the community where this study was carried out requires more concrete knowledge with regard to the contents of the publications of the SAFBDG and its operational procedures.

It can be argued that although the guidelines were developed to inspire better dietary practices, not all the recommendations are being adhered to, therefore government and non-governmental organizations intervention is recommended in this matter.

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APPENDICES

APPENDIX A: TURNITIN REPORT

turnitin

Digital Receipt

This receipt acknowledges that Turnitin received your paper. Below you will find the receipt information regarding your submission.

The first page of your submissions is displayed below.

Submission author:	Yc Majija
Assignment title:	LCS 2018 Submissions
Submission title:	M Consumer Science dissertation
File name:	02_FINAL_CORRECTIONS_TVE-E...
File size:	2.55M
Page count:	169
Word count:	52,693
Character count:	296,963
Submission date:	28-Feb-2018 11:41AM (UTC+0200)
Submission ID:	922816814

APPENDIX B: QUESTIONNAIRE

UNISA

QUESTIONNAIRE ON NUTRITION KNOWLEDGE OF MOTHERS IN MTHATHA

This research is part of a Master Degree in Consumer Science at the University of South Africa. Your kind participation will be highly appreciated.

Instructions to respondents

Please complete the following form by marking a tick (√) in the appropriate block that best represents your answer. Your opinion on the statements to follow in section B are very valuable to the researcher and should be answered with great care and honesty. Your identity will not be revealed in any way by the researcher as your participation is anonymous as far as the completion of the questionnaire is concerned and the representation of the data. You are reminded of the voluntary participation and that you may withdraw at any point should you wish to do so. You are also reminded of the consent form and requested to make sure that you have signed and handed back to the researcher.

SECTION A: NUTRITION KNOWLEDGE

Example:

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Eating sweets is just as good as eating vegetables					√

Fill in the following table as per instruction above by placing a tick in the box that best represents your answer for each of the statements. To do this you have to think about the statement and then consider the options between Strongly Agree – Strongly Disagree and pick the most appropriate option that best represents your answer.

Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. A healthy diet should include a lot of fatty foods					
2. I like giving my family just pap					
3. It is good to drink a lot of soft drinks daily					

YC Majija

4. It is important to drink a lot of water daily					
5. You need food such as pap or bread in every meal as it gives you energy for the day					
6. I usually put salt on my food when it is on my plate					
7. Your body needs alcohol to stay healthy					
8. A healthy diet should include chicken, meat, eggs and cheese in large quantities					
9. A healthy diet should include a lot of vegetables and fruit daily					
10. It is unhealthy to be fat					
11. Add bicarbonate of soda when boiling vegetables					
12. It is not necessary to limit salt when cooking					
13. Healthy food helps us not to get sick					
14. Soy beans are rich in protein					
15. Drinking a lot of water is harmful to your body					
16. It is healthy to be physically active					
17. Red meat is healthier than chicken					
18. Our diet should include a lot of different foods					
19. Being active has nothing to do with being health					
20. I prefer to eat white bread even though brown bread is healthier					
21. Vegetables should be cooked in a little water for a short time					
22. Eating a lot of food rich in sugar daily will cause bad teeth					
23. I do not care what I give my family, as long as they get their stomach full					
24. Drinking a lot of beer is harmful to your body					
25. Meat, fish, chicken and milk are good sources of protein					
26. Eating eggs is just as good as eating meat					

27. It is a good practice to eat a packet of Simba chips everyday					
28. Dried beans can be used instead of meat					
29. It is necessary to put oil or fat when cooking vegetables					
30. Fish is just as healthy as red meat					
31. Our daily diet should include vegetables and starch only					
32. Vegetables cooked in little water protects us against illnesses than vegetables cooked for a long time in more water					
33. Brown sugar is better than white sugar					
34. Dried beans are cheap alternative for meat					
35. It is not necessary to cover a bucket of clean water					
36. I only buy food that is cheap					
37. Fruit and vegetables help to build up the body					
38. It is healthy to take alcoholic drinks daily					
39. Drinking a lot of fruit juice is harmful to your body					
40. A healthy diet should many foods containing a lot of sugar					
41. It is not healthy to you to eat lots of fat					
42. Vegetables must be cooked in a lot of water for a long time					
43. Starchy food supplies body with energy					
44. Our daily diet should include foods of one type, e.g. starchy foods only					
45. Cooked vegetables must be left lying in water after they are cooked					
46. Water drawn from rivers, dams and well has to be boiled before use					
47. Starchy food should fill a large portion of my plate					
48. It is healthier to eat an apple instead of sweets					
49. Fried food is healthier than boiled food					

SECTION B: NUTRITION RELATED OPINIONS

Complete this section by writing your ideas and thoughts down for each of the following questions. There are no right or wrong answers. The researcher is interested in your honest and thoughtful opinion.

What do you understand by "Healthy Eating"?

.....

.....

.....

.....

Can you name a couple of types of food you consider to be healthy food?

.....

.....

.....

.....

Why do you consider these foods to be healthy?

.....

.....

.....

.....

Can you name a couple of types of food you consider to be unhealthy food?

.....

.....

.....

.....

What good nutritional practices do you apply?

.....

.....

.....

What constraints do you encounter when you apply good nutritional practices?

.....

.....

.....

SECTION C: RESPONDENT INFORMATION

Complete this section by placing a tick in the box next to the most relevant answer

Example: A baby goat is called a

Puppy		*Kid*	√	*Piglet*		*Kitten*	

Age

Under 30		31-49		50-69		Over 69	

Education

Less than High School		High School		More than High School	

Marital Status

Married		Unmarried		Divorced		Widow	

Employment Status

Employed		Unemployed		Part time		Other	

YC Majija

Spouse Employment Status

Employed		Not Employed		Part timer		Other	

Income

≤ R1000		R1000-5000		R6000-10 000		R11000-15 000		≥ R15 000	

Years of children at home	
6 – 11 years	
12 – 18 years	
19 and over	

Number of children at home	
1	
2-3	
4-5	
6 and more	

Please note that the researcher undertakes to give feedback to the groups who assisted in participating in the study. An announcement to that effect will be communicated to the gatekeeper for you to attend the feedback session should you wish to do so.

I thank you for your time and contribution to this study.

YC Majija

APPENDIX C: CONSENT FORMS

UNISA university of south africa

Consent Form

TITLE OF RESEARCH PROJECT

Exploring the nutrition related knowledge and understanding of mothers in Mthatha

Dear Mr/Mrs/Miss/Ms _____ Date...../...../2014

NATURE AND PURPOSE OF THE STUDY

The purpose of this research project is to explore mothers' knowledge and understanding of nutrition who reside in Mthatha. This is particularly important as mothers play a critical role in the nutritional status of children. The knowledge and understanding of nutrition is one of the role players in the nutritional status of children which needs to be explored if improved nutrition is to be achieved. The study will make use of a self-administered questionnaire to determine the knowledge and understanding of nutrition from mothers residing in Mthatha.

RESEARCH PROCESS

1. The study requires your participation in the completion of a self-administered questionnaire
2. The completion of this questionnaire will be administered by the researcher
3. You will be handed a questionnaire in which instance you should read every question and alternatives and complete according to the instruction of the researcher.
4. You may select the option that best represents your idea or answer.
5. Do not share your responses with your fellow participants.
6. When you have completed the questionnaire, hand back to the researcher.

NOTIFICATION that no photographs or video recordings or digital tape recordings will be made

This is to certify that the researcher will not make use of any of the devices listed in this heading. Should it become necessary to do so the researcher will ask your permission in which instance you may decline or approve of the use of any of these devises.

CONFIDENTIALITY

You are guaranteed confidentiality of any information captured on the questionnaire in the following way:

1. The information will not be shared with anyone outside of the supervisors and student.
2. Findings will not be discussed with anyone who is not directly involved in the study such as the supervisors.

WITHDRAWAL CLAUSE

I understand that I may withdraw from the completion of the questionnaire at any time. I therefore participate voluntarily until such time as I request otherwise. If I withdraw I will hand the questionnaire back to the researcher.

POTENTIAL BENEFITS OF THE STUDY

This research study will benefit mothers in terms of providing valuable information they require to provide nutritional and well balanced meals using the resources accessible to them. The academic contribution of this study will be of value to not only Scientists but also would benefit NGO's; Health care workers and Government.

INFORMATION

If I have any questions concerning the study, I may contact the supervisor, Prof Elizabeth Kempen, at the Department of Life and Consumer Sciences, Florida campus, Unisa, tel: 011 471 2241.

CONSENT

I, the undersigned, ... (full name) have read the above information relating to the project and have also heard the verbal version, and declare that I understand it. I have been afforded the opportunity to discuss relevant aspects of the project with the project leader, and hereby declare that I agree voluntarily to participate in the project.

I indemnify the university and any employee or student of the university against any liability that I may incur during the course of the project.

I further undertake to make no claim against the university in respect of damages to my person or reputation that may be incurred as a result of the project/trial or through the fault of other participants, unless resulting from negligence on the part of the university, its employees or students.

I have received a signed copy of this consent form.

Signature of participant: .....

Signed at ..... on .....

WITNESSES

1 .....

2 .....

APPENDIX D: ETHICAL CLEARANCE

UNISA university of south africa

2014-03-20

Ref. Nr.: 2014/CAES/067

To:
Student: YC Mejija — Student nr: 08938008
Supervisor: Prof EL Kempen
Department of Life and Consumer Sciences
College of Agriculture and Environmental Sciences

Dear Prof Kempen and Mrs Mejija

Request for Ethical approval for the following research project:

Exploring the nutrition related knowledge and understanding of mothers in Mthatha

The application for ethical clearance in respect of the above mentioned research has been reviewed by the Research Ethics Review Committee of the College of Agriculture and Environmental Sciences, Unisa. Ethics clearance for the above mentioned project (Ref. Nr.: 2014/CAES/067) is given for the duration of the research project.

Please be advised that should any part of the research methodology change in any way it is the responsibility of the researcher to inform the CAES Ethics committee of such changes. In this instance a memo should be submitted to the Ethics Committee in which the changes are identified and fully explained.

The Ethics Committee wishes you all the best with this research undertaking.

Kind regards,

Prof E Kempen,
CAES Ethics Review Committee Chair

Prof MJ Linington
Executive Dean: College of Agriculture and Environmental Sciences

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392, UNISA 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150
www.unisa.ac.za

Open Rubric

APPENDIX E: REQUEST TO ADMINISTER QUESTIONNAIRES

No. 4 Cypress Street
Fort gale
Mthatha
5 December 2012

To: THE HONOURABLE PROVOST
ST JOHN'S ANGLICAN CHURCH
MTHATHA

Dear Provost

REQUEST TO ADMINISTER QUESTIONNAIRES TO MOTHERS WHO ARE RESPONSIBLE FOR FAMILY FOOD CHOICE AND PREPERATION IN MTHATHA.

I hereby wish to apply for permission to administer questionnaires to women in your congregational church.

I am presently studying part time (Food and Nutrition discipline) towards completion of the Masters in Consumer Science Degree with the University of South Africa. The title of my dissertation is: **Mother's nutrition knowledge and its possible influence on eating patterns of children in Mthatha; Eastern Cape.**

The purpose of the research study is to explore mother's nutrition knowledge in relation to eating habits of children.

This research study will benefit mothers in terms of providing valuable information they require to provide nutritional and well balanced meals using the resources accessible to them. The academic contribution of this study will be of value to not only Scientists but also would benefit NGO's; Health care workers and Government.

Enclosed please find a copy of a synopsis of this research study and subsequently, a questionnaire to this effect.

Please note, for ethical consideration consent forms will be completed for every voluntary participant.

I hope you will find the content of this letter in order and would kindly consider this request.

Thanking you in anticipation.

Yours sincerely

Mrs YC Majija (Mobile: 079 554 2746)

No 4 Cypress Streeet

Fortgale, Mthatha

20 February 2014

To: THE DIRECTOR

DEPARTMENT OF HEALTH

KSD SUB DISTRICT

MTHATHA

REQUEST TO ADMINISTER QUESTIONNAIRES TO NURSING MOTHERS WHO ARE RESPONSIBLE FOR CHOOSING AND PREPARING FOOD FOR THEIR FAMILIES

Dear Madam

I hereby wish to apply for the permission to administer questionnaires in mothers who attend Stanford Terrance and Civic Center Clinics for studying purposes.

I am pursuing my Master's Degree in Consumer Science with the University of South Africa as a part-time student. The tittle of my dissertation is: Mothers' nutrition knowledge and possible influence on eating habits of children in Mthatha; Eastern Cape

This study will benefit mothers in providing valuable information they require to provide nutritional and well balanced meals using the resources accessible to them. The academic contribution of this study will be of value not only to Scientists but also would benefit NGOs, Health care workers and Government.

Attached please find a copy of synopsis of this research of this study and subsequently, a questionnaire to this effect.

Please note, for ethical consideration consent forms will be completed for every participant.

I hope you will find the content of this letter in order and would kindly consider this request.

Yours sincerely

Ms YC Majija (Mobile: 079 554 2746)

No 4 Cypress Street

Fortgale

Mthatha

20 February 2014

To: Director Clinical Governance

Mthatha Hospital Complex

OR Tambo Region

MTHATHA

REQUEST TO ADMINISTER QUESTIONNAIRES TO NURSING MOTHERS WHO ARE RESPONSIBLE FOR CHOOSING AND PREPARING FOOD FOR THEIR FAMILIES

Dear Sir

I hereby wish to apply for the permission to administer questionnaires in mothers who attend Nelson Mandela Hospital for studying purposes.

I am pursuing my Master's Degree in Consumer Science with the University of South Africa as a part-time student. The tittle of my dissertation is: Mothers' nutrition knowledge and possible influence on eating habits of children in Mthatha; Eastern Cape

This study will benefit mothers in providing valuable information they require to provide nutritional and well balanced meals using the resources accessible to them. The academic contribution of this study will be of value not only to Scientists but also would benefit NGOs, Health care workers and Government.

Attached please find a copy of synopsis of this research of this study and subsequently, a questionnaire to this effect. Please note, for ethical consideration consent forms will be completed for every voluntary participant.

I hope you will find the content of this letter in order and would kindly consider this request.

Yours sincerely

Ms YC Majija (Mobile: 079 554 2746)

APPENDIX F: ACCEPTANCE LETTERS

ST. JOHN'S COLLEGIATE CHURCH

ANGLICAN DIOCESE OF MTHATHA (C.P.S.A.)

P.O.Box 233
Mthatha
5099

No 26 Callaway Street
Mthatha
5099

Tel/Fax: 047 5310118
e-mail:stjohnscollegiate@telkomsa.net

DEAR Mrs Y.C MAJIJA

I greet you in Name of our Lord Jesus Christ. Upon receiving your letter dated 5 JUNE 2013 requesting to administer questioners to mothers who are responsible for family food choice and preparation in Mthatha.

I therefore allow you to conduct such practice within our church. Hoping that our mothers will be of good help, and that they will also benefit from this research.

Yours in Christ

The Very Revd. Mlungisi Solly Mbele
Provost and the Rector of St John's Collegiate Church

ST. JOHN'S COLLEGIATE CHURCH
No. 26 CALLAWAY STREET
MTHATHA 5099
2014 -01- 12
TEL: 047 - 531 0118
THE PROVOST OF ST. JOHN'S COLLEGIATE
SIGNATURE

Province of the
EASTERN CAPE
HEALTH

Clinical Governance Office *Mthatha Hospital Complex*Bedford Orthopaedic Hospital
Level 1* Nelson Mandela Academic Hospital * Sission Street* Forthgale* Mthatha*
Private Bag/Ingxowa Eyodwa/Privaatsak X5152, Mthatha, 5100, SOUTH AFRICA
Tell: 047 502 4440/4438 Fax 047502 4907

TO	MRS. Y.C. MAJIJA
FROM	DR T.M. MADIBA – DIRECTOR CLINICAL GOVERNANCE
SUBJECT	ADMINISTERING QUSETIONNAIRES TO MOTHERS WHO ARE RESPONSIBLE FOR FAMILY FOOD CHOICE AND PREPARATION
DATE	5/06/2013

Dear Madam

The office of the Clinical Governance would like to confirm receipt of your request to administer questionnaires to mothers who are responsible for family food choice and preparation in Mthatha Hospital Complex.

We therefore allow her to make such practice, hoping this will benefit the mothers in the O.R. Tambo region and surrounding areas.

Yours in Service

.....

Dr. T.M. Madiba
Director Clinical Governance
Mthatha Hospital Complex
Date: 2.1.10.2013

PROVINCE OF THE

EASTERN CAPE

DEPARTMENT OF HEALTH

DEPARTMENT OF HEALTH: 100 OLD REVENUE OFFICES: KING SABATA DALINDYEBO SUB DISTRICT: MTHATHA
TEL: 047 5314362/047 5310110:

Enquiries: Ntshanga N.S

Cell: 0833781467

Date : 21/02/14

Fax: 047 5311344

Ms Majija Yolisa

.....

.....

RE-APPROVAL: YOURSELF TO CONDUCT A STUDY ON FOOD BASED DIGTARY GUIDELINES AT THE FOLLOWING CLINICS NGANGELIZWE CHC, STANFORD TERRACE AND CIVIC CENTRE

KSD Sub district hereby grant you the permission to conduct the above study at the above facilities. This will enable the Sub District to identify gaps and you are required to submit your findings and recommendations to the Sub District. You are requested also to contact the Department of Health prior any publication of your findings.

SUB DISTRICT MANAGER

KING SABATA DALINDYEBO L.A.S.
L.H.S.A.
2014 -02- 21
P/Bag X5006 - MTHATHA
EASTERN CAPE PROVINCE

PGDP EASTERN CAPE